

# Service Manual

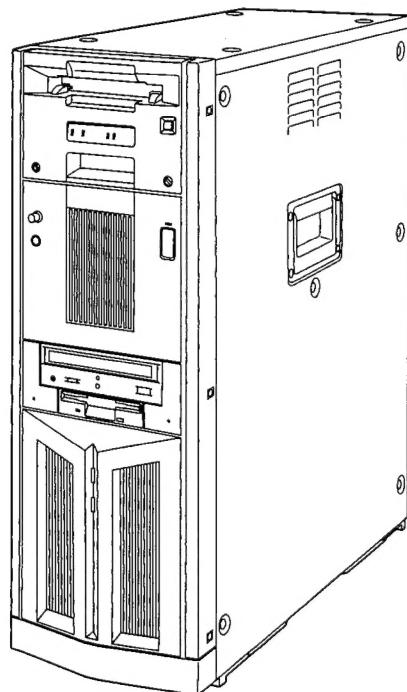
**DVC PRO**

DVC PRO Nonlinear Editing System

**AJ-DE77E**

**Vol. 1**

- Sec. 1** *Operating Instructions & Installation Manual*
- Sec. 2** *Disassembly Method*
- Sec. 3** *Maintenance & Mechanical Adjustment*
- Sec. 4** *Electrical Adjustment*
- Sec. 5** *Block Diagrams*
- Sec. 6** *Service Information*



**Panasonic**

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## ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

# Specifications

## [GENERAL]

**Power supply:** 220 V – 230 V (±10%) AC, 50 – 60 Hz  
**Rated current:** 2.1 A – 2.0 A

**Ambient operating temperature:**

5°C to 35°C

**Ambient operating humidity:**

10 to 80% (no condensation)

**Dimensions (W) × (H) × (D):**

230 × 637 × 550 mm

**Weight:**

41.5 kg (main unit only)

## [PC]

**CPU:**

Pentium Pro, 200 MHz

**Operating system:**

Windows NT 4.0

**Memory:**

64 MB

**System hard disk drive:**

1.6 GB (EIDE)

**AV hard disk drive:**

Video: 4 GB × 4, Audio: 4 GB × 2

(Recording for a nominal duration of 70 minutes is possible.)

**CD-ROM:**

24 time normal speed, ATAPI specifications supported

**Floppy disk drive:**

3.5"

## [VTR]

**Recording format:**

DVCPRO format

**Tape speed:**

135.4156 mm/sec.

**Recording/playback time:**

126 minutes (using AJ-P126LP tape)

## [VIDEO]

**Sampling frequency:**

Y: 13.5 MHz

PB/PR: 3.375 MHz (4:1:1)

**Quantizing:**

8 bits/sample

**Compression:**

DVCPRO compression

## [AUDIO]

**Sampling frequency:**

48 kHz

**Quantizing:**

16 bits/sample

**Number of channels:**

2 channels (internal: 6 channels)

## [INPUT/OUTPUT CONNECTORS]

### ■ Video input connectors

**Analog composite:**

BNC × 2 (loop-through configuration)

**Analog component (Y, Pb, Pr):**

BNC × 3

**Analog reference video:**

BNC × 2 (loop-through configuration)

### ■ Video output connectors

**Analog composite:**

BNC × 2

**Analog component (Y, Pb, Pr):**

BNC × 3

**Analog composite monitor:**

BNC × 1 (with superimposed data)

### ■ Audio input connectors

**Analog (CH1/CH2):**

XLR × 2 (high impedance), 0 dBu

### ■ Audio output connectors

**Analog (CH1/CH2):**

XLR × 2 (low impedance), +4/0/-20 dBu

**Digital (CH1/CH2):**

XLR × 1, AES/EBU format

**Monitor (L/R):**

XLR × 2 (low impedance), +4/0/-20 dBu

**Headphones:**

M6 (variable level), 8 ohms

### ■ Other connectors

**Time code output:**

XLR × 1

**External VTR control:**

RS-422A (D-SUB, 9P) × 2

**Error report/Editing pad connection:**

RS-232C (D-SUB, 25P) × 2

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# SAFETY PRECAUTIONS

## GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

## LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between  $1\text{M}\Omega$  and  $5.2\text{M}\Omega$ . When the exposed metal dose not have a return path to the chassis, the reading must be  $\infty$ .

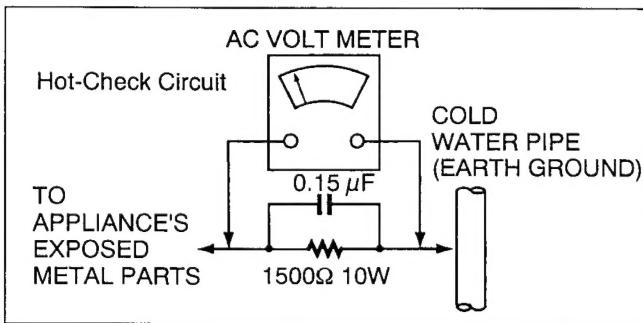


Figure 1

## LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a  $1.5\text{K}\Omega$ ,  $10\text{W}$  resistor, in parallel with  $0.15\mu\text{F}$  capacitor, between each exposed metallic part on the set an a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

## ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION:Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices.(Otherwise harmless mother such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

## X-RADIATION

### WARNING

1. The potential source of X-Radiation in EVF sets is the High Voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that jig is capable of handling 10kV without causing X-Radiation.

NOTE:It is important to use an accurate periodically calibrated high voltage meter.

3. Measure the High Voltage. The meter (electric type) reading should indicate  $2.5\text{kV}$ ,  $\pm 0.15\text{kV}$ . If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

# Caution for AC Mains Lead

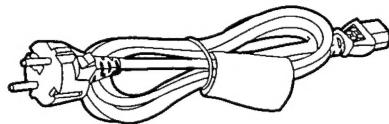
## FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

This product is equipped with 2 types of AC mains cable. One is for continental Europe, etc. and the other one is only for U.K.

Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

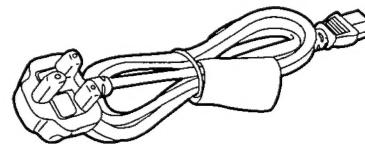
### FOR CONTINENTAL EUROPE, ETC.

Not to be used in the U.K.



### FOR U.K. ONLY

If the plug supplied is not suitable for your socket outlet, it should be cut off and appropriate one fitted.



### FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 13 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 13 amps and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

**IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.**

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

**WARNING: THIS APPLIANCE MUST BE EARTHED.**

**IMPORTANT:** The wires in this mains lead are coloured in accordance with the following code:

Green-and-Yellow: Earth

Blue: Neutral

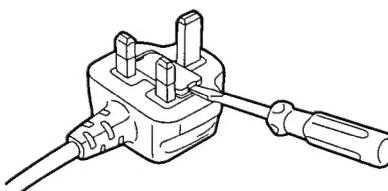
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

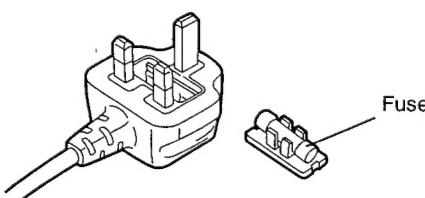
- The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol  or coloured GREEN or GREEN-AND-YELLOW.
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

### How to replace the fuse

1. Open the fuse compartment with a screwdriver.

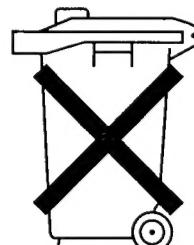


2. Replace the fuse.



## Attention/Attentie

- This apparatus contains a lithium battery for memory back-up.
- For the removal of the battery at the moment of the disposal at the end of the service life please consult your dealer.
- Do not throw away the battery. Instead, hand it in as hazardous waste.
- Dit apparaat bevat een lithiumbatterij voor memory back-up.
- Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.
- Gooi de batterij niet weg, maar lever hem in als KCA.



# SECTION 1

# OPERATING INSTRUCTION & SERVICE INFORMATION

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## Features

### All-in-one tower design

This is the first non-linear editor to incorporate a VTR for uploading and downloading applications. This feature translates into savings in terms of both the cost and space required for an externally connected VTR, and it enables DVC PRO tapes to be loaded just like floppy disks or magneto-optical disks. The unit also contains a hard disk for audio-video recording, and its size is the same as a tower-type personal computer. It can be placed by the side of a desk for highly efficient editing operations.

### Transfer and saving at 4 times normal speed

Uploading and downloading between the built-in VTR and hard disk can be conducted at 4 times normal speed. As a result, it takes much less time to perform the preparatory steps which handicap non-linear editing. Simple-assemble mode can be conducted at 4 times normal speed with 4 frame accuracy.

### Same high picture quality recording as with DVC PRO

The same digital component compression recording system as for DVC PRO is used to record data onto the hard disk. The resulting picture quality is higher than that achieved by JPEG which has been adopted by many non-linear editors (comparison made at the same transfer rate).

Seventy minutes of picture and sound data can be recorded on the internal hard disk (standard specifications: 16GB).

### Transfer of data while still compressed

The data is uploaded or downloaded at 4 times normal speed between the tape and disk using the DV compression format which obviates the need for A/D (D/A) conversion and compression/expansion processes. Consequently, there is absolutely no deterioration in the picture quality during transfer.

### Editing of data while still compressed

In the case of cut editing, the unit leaves the recorded data completely unchanged. With the data still in its compressed form, changes are made only to the read sequence and positions. During recording, the DV compressed data does not need to be expanded at all, and it can be edited up to the form taken by the completed package. This means that high picture quality is maintained even after editing.

(When the special effect and superimpose functions are used, the data is expanded into full bit digital video data, and compressed back again after processing.)

1-1

### Real-time preview of special effects

The unit contains a switcher so that wipe, dissolve and other special effects can be previewed on a real-time basis during A/B roll editing. Trial-and-error operations can be repeated any number of times while checking how the results turn out.

### External VTR control (RS-422A)

The unit's RS-422A (9 Pin) remote connector enables a wide range of analog or digital VTRs to be controlled. This function enables material to be incorporated and completed packages to be transmitted.

### WJ-MX1000 operation system adopted

The unit features a user interface which is compatible with the Panasonic's non-linear AV work station (WJ-MX1000), and the software (see Note) has been upgraded so that it can be run optimally in Windows NT.

(Note: The software is handled by Matsushita Communication Industrial Co., Ltd Broadcast System Division.)

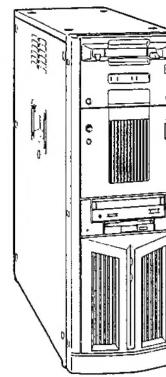
### Streamlined operations using mouse

All the operator has to do in order to add, replace or delete cuts is rearrange the clips by operating the mouse. Cut editing can be achieved with excellent response.

## Warning

**This unit must not be used on board a vehicle. Doing so may damage the hard disk drive and destroy the data.**

## System Configuration

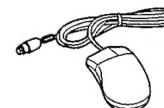


Main unit

Do not subject the supplied mouse, keyboard or cables to strong bumps or shocks. Doing so could damage them.



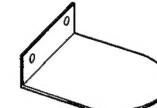
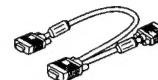
Keyboard



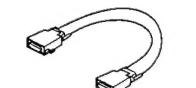
Mouse



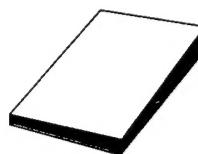
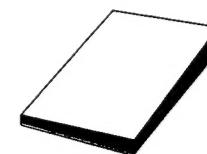
Power cord

Stabilizers (x4)  
mounting screws (x8)

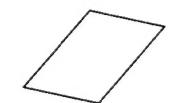
VGA cable



D-SUB 60-pin cable

Operating instructions  
(which you are now reading)

Installation manual



Warranty card

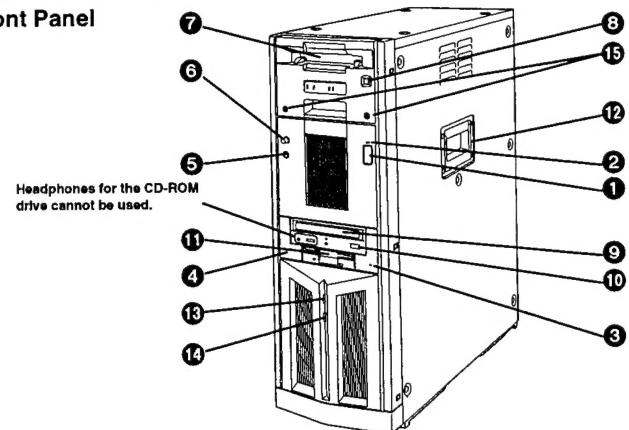


Ferrite cores (x4)

When the SCSI hard disk drive for external expansion purposes is to be connected, attach one ferrite core to one end of the SCSI I/F cable and the other one to the other end.

## Parts and Their Functions

### Front Panel



### ① Main unit power switch

Set this switch to the OFF position after quitting the system. If the power is turned off while the hard disk drive is operating, data may be lost or the drive may be damaged.

Do NOT turn off the power while white characters on a blue background appear on the monitor display (for the personal computer) during startup.

### ② Main unit power LED

### ③ HDD sub switch

Press this switch if PC unit's power does not come on even when the main unit power switch is set to ON.

Do not press this switch without good reason since the power of the PC unit will be turned off if it pressed while the power is supplied.

### ④ HDD reset switch

Press this switch when the PC unit is not operating properly. The start screen will now be restored, and checks on the operation can be carried out.

Do NOT press this switch while white characters on a blue background appear on the monitor display (for the personal computer) during startup.

### ⑤ Phones jack

The sound can be monitored when stereo headphones are connected to this jack.

### ⑥ Phones volume control

This is used to adjust the headphones volume and the monitor output volume.

1  
2

### ⑦ Cassette slot

M cassettes or L cassettes are loaded through this slot. Consumer-use cassettes cannot be used for recording or playback.

### ⑧ Cassette tape EJECT button

When this button is pressed, the tape is unloaded, and the cassette is automatically ejected several seconds later.

### ⑨ CD-ROM drive

Headphones for the CD-ROM drive cannot be used.

### ⑩ Tray OPEN/CLOSE button

### ⑪ Floppy disk drive

### ⑫ Carrying handle

### ⑬ HDD access display lamp (system)

### ⑭ HDD access display lamp (AV data)

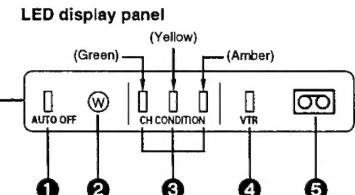
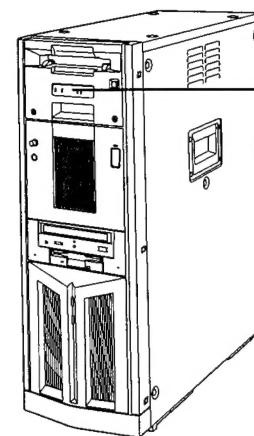
### ⑮ Screws for securing mechanism

Loosen these screws when cleaning the head mechanism transport system of the VTR unit or when conducting other kinds of servicing or maintenance. It will then be possible to pull out the VTR unit's mechanism.

After the maintenance work has been completed or when the unit is to be moved, the mechanism must be put back inside the unit and the screws tightened up securely.

## Parts and Their Functions

### LED Display Panel



### ① AUTO OFF lamp

This lights when trouble has occurred in the unit's operation.

### ② Warning lamp

This lights when a warning item has occurred.

### ③ Channel condition lamps

One of these lamps lights in accordance with the error rate status.  
(Green → yellow → amber)

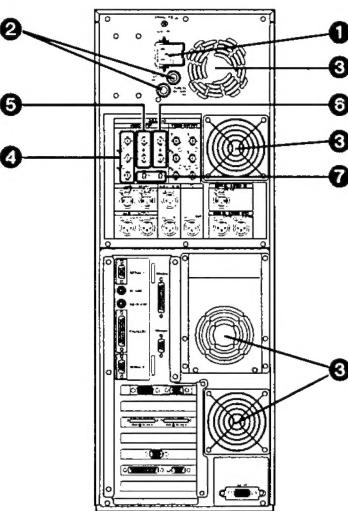
**Green:** This lights when the video and audio play signal error rates are at acceptable levels.

**Yellow:** This lights when either the video or audio play signal error rate has deteriorated. The playback picture remains normal even while this lamp is lit.

**Amber:** This lights when either the video or audio play signal error rate is subject to correction or interpolation.

## Parts and Their Functions

### Rear Panel



1-3

**1 AC power socket [~AC IN]**  
The power cord (provided) is connected to this socket.

**2 Fuse holder**  
This holder contains a fuse.  
FUSE 1: for VTR unit [250 V, T4H]  
FUSE 2: for PC unit [250 V, T5H]

**3 Ventilating fan**  
This fan prevents the internal temperature from rising. Do not block the fan openings by placing the unit right up against a wall or other object.

**4 Analog component video signal input connectors [ANALOG, VIDEO INPUT, Y/Pb/Pr]**  
The analog component video signals are supplied to these connectors. Connect a VTR or other video unit with a component signal output capability here.

**5 Analog composite video signal input connectors [ANALOG, VIDEO INPUT, VIDEO IN]**

The analog composite video signals are supplied to these connectors which are joined by a loop-through configuration. Connect a VTR or other video unit with a composite signal output capability here.

A simple decoder is used by the composite inputs. If a higher picture quality is required, the use of an external high-performance decoder is recommended.

**6 Analog reference video signal input connectors [ANALOG, VIDEO INPUT, REF VIDEO IN]**

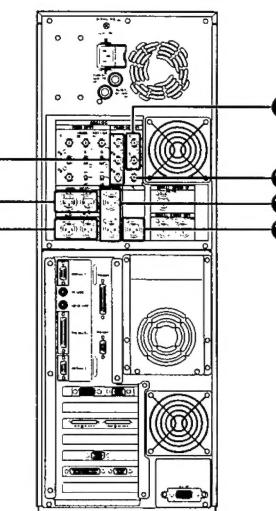
The analog reference video signals are supplied to these connectors.

In order to ensure that the video and audio signals played back are stable, the following procedure must be followed: supply stable black burst signals to these connectors from an external sync signal generator or other such unit, open the system set-up panel using the device set-up utility (see pages 1 to 4 in Chapter 10 of the Software Package Reference Manual), and use the Blackburst Genlock Input setting for operation.

**7 75-ohm termination switch**  
Set this to ON for termination.

## Parts and Their Functions

### Rear Panel



**8 Analog component video signal output connectors [ANALOG, VIDEO OUTPUT, Y/Pb/Pr]**  
The analog component video signals are output from these connectors. Connect a VTR or other video unit with a component signal input capability here.

**9 Analog composite video signal output connectors [ANALOG, VIDEO OUTPUT, 1/2]**

The analog composite video signals are output from these connectors.

Connect a VTR or other video unit with a composite signal input capability here.

**10 Analog video monitor signal output connector [ANALOG, VIDEO OUTPUT, MON OUT]**  
The analog composite video signals with superimposed data are output from this connector. Connect a monitor (video) for monitoring the pictures here.

**11 Analog audio signal input connectors [ANALOG, AUDIO INPUT, CH1/CH2]**

The analog audio signals are supplied to these connectors.

Connect a CD player, VTR or other audio unit capable of outputting analog audio signals to these connectors.

**12 Analog audio signal output connectors [ANALOG, AUDIO OUTPUT, CH1/CH2]**

The analog audio signals are output from these connectors. Connect an audio amplifier, VTR other audio unit capable of handling analog audio signals to these connectors.

**13 Analog audio monitor signal output connectors [ANALOG, AUDIO MON, L/R]**

The audio playback signals are output from these connectors. Connect monitor speakers, etc. to them.

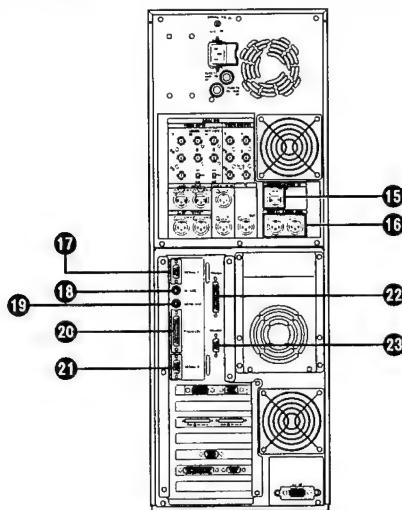
**14 Analog time code signal output connector [ANALOG, TC, OUT]**

During playback, the playback time code is output from this connector; during recording, the time code generated by the built-in time code generator is output.

Connect a VTR with a time code input connector here.

## Parts and Their Functions

### Rear Panel



15 **Digital audio signal input connector [DIGITAL AUDIO IN, CH1/CH2]**  
Connect a digital audio unit equipped with AES/EBU output connectors here.  
(Future plans call for this connector to be used to support some options. For details, please consult with your dealer.)

16 **Digital audio signal output connectors [DIGITAL AUDIO OUT, CH1/CH2, (CH3/CH4)]**  
Connect a VTR equipped with AES/EBU input connectors here.

17 **Serial 1 connector [SERIAL 1]**  
Spare connector

18 **Mouse connector [MOUSE]**  
Connect the mouse (provided) here.

19 **Keyboard connector [KEYBOARD]**  
Connect the keyboard (provided) here.

20 **Parallel connector [PARALLEL]**  
Connect a device with a parallel interface here.

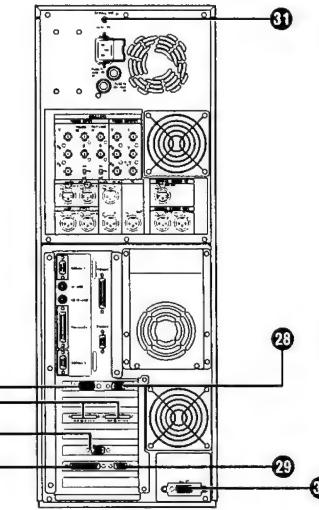
21 **Serial 2 connector [SERIAL 2]**  
Spare connector

22 **RS-232C connector [RS-232C]**  
Connect the editing pad here.  
(Options supported: For details, please consult with your dealer.)

23 **RS-422A connector [RS-422A]**  
Connect an external VTR (External VTR1) which can be controlled using an RS-422A interface to control its recording and playback functions.

## Parts and Their Functions

### Rear Panel



24 **AV I/F connector**  
This is connected to the ● AV I/F connector.

25 **SCSI connector**  
Connect a SCSI hard disk drive for external expansion purposes.  
(Options supported: For details, please consult with your dealer.)

26 **SVGA I/F connector**  
Connect the VGA cable here. This connector is connected with ● and connected to the SVGA monitor.

27 **RS-232C connector**  
Spare connector (for maintenance purposes)

28 **SVGA I/F connector**  
Connect the VGA cable here. This connector is connected with ● and connected to the SVGA monitor.

29 **RS-422A connector [RS-422A]**  
Connect an external VTR (External VTR2) which can be controlled using an RS-422A interface to control its recording and playback functions.

30 **AV I/F connector**  
This is connected to the ● AV I/F connector.

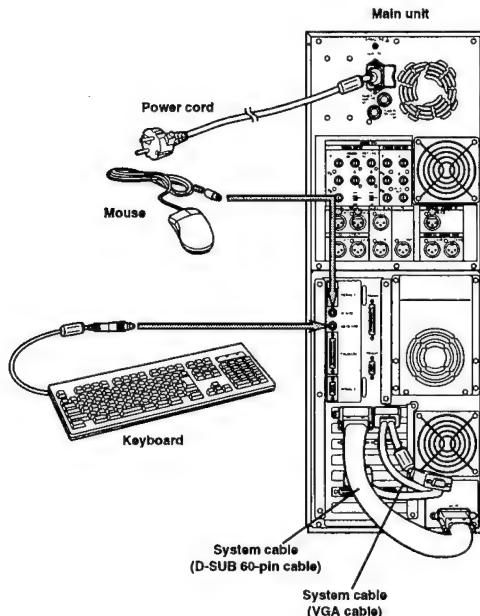
31 **SIGNAL GND terminal**  
This is connected to the signal ground terminal on the unit connected in order to reduce the noise. It is not a safety ground.

## Connections

### Basic Connections

#### (Connecting the power cord, keyboard, mouse and system cables)

1. Connect the system cables (VGA cable and D-SUB 60-pin cable).
2. Connect the keyboard and mouse to their respective connectors.
3. Connect the power cord.



E-5

## Connections

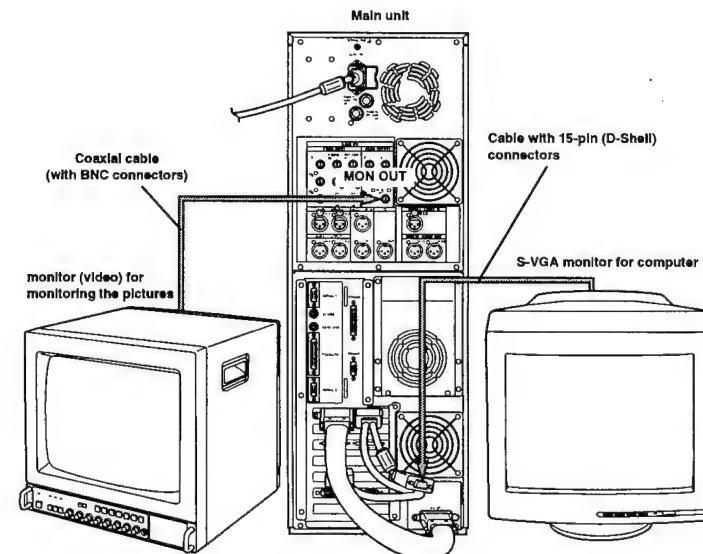
### Monitor Connections

#### ■ Connecting the personal computer monitor (S-VGA)

Connect the computer monitor to the VGA cable. Use a monitor which meets the following conditions.

##### Default settings

- Resolution : 1152 × 870 pixels
- Refresh frequency : 75 Hz



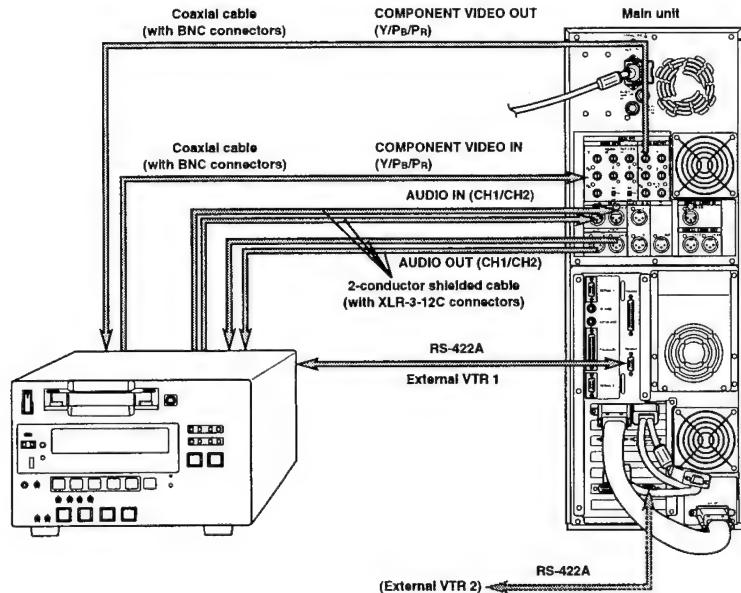
#### ■ Connecting the monitor (video) for monitoring the pictures

Connect the monitor (video) for monitoring the pictures to the analog video monitor signal output (MON OUT) connector. The pictures during recording and playback can now be checked.

## Connections

### VTR Connections

Connect a commercial video cassette recorder/player



1-6

#### Note:

Set the TAPE/EE selector switch of the external VTR to the TAPE position. (If it is set to EE, the picture may be unstable and audio may be transmitted.)

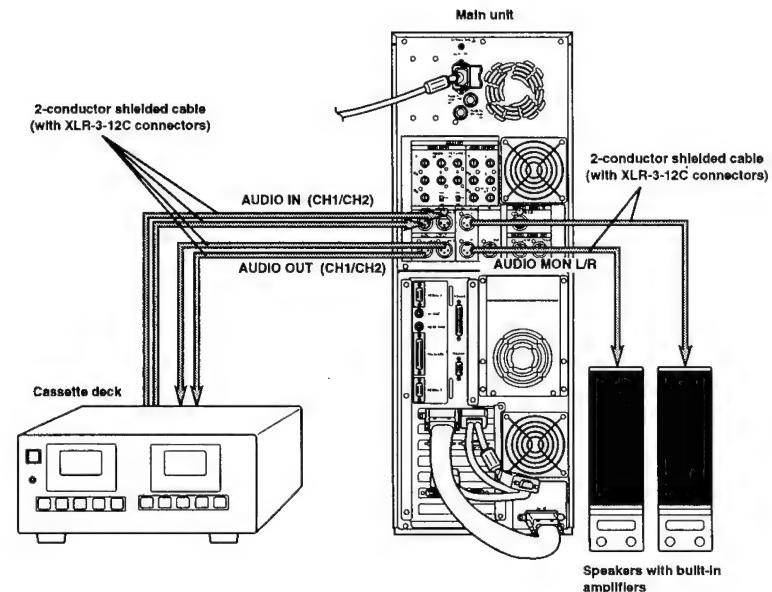
If the VTR is not equipped with a TAPE/EE selector switch, use one of the two connection configurations described below:

1. To use the external VTR for playback only, connect the outputs of the external VTR to the inputs of the editing system unit.
2. To use the external VTR for recording only, connect the inputs of the external VTR to the outputs of the editing system unit.

## Connections

### Audio Equipment Connections

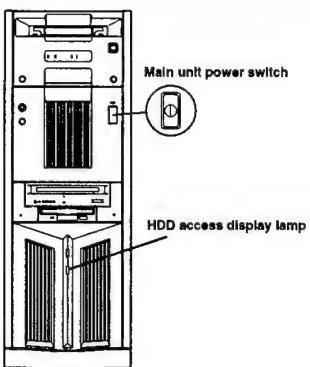
Connect speakers with built-in amplifiers, a cassette deck or other audio unit.



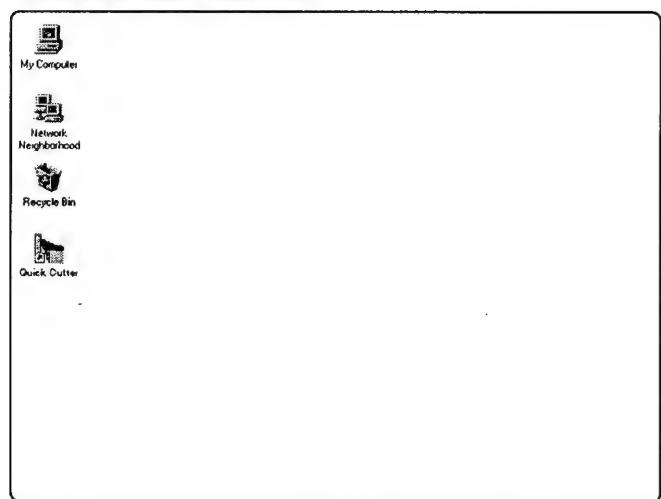
## System Startup and Exit

### System Startup

- 1 Set the power switches of the peripheral units to ON.
- 2 Set the power switch on the main unit to ON. The HDD access display lamp on the main unit's front panel lights.
- 3 The system starts up, and Windows NT also starts up.



Computer monitor/Windows NT startup screen



1-7

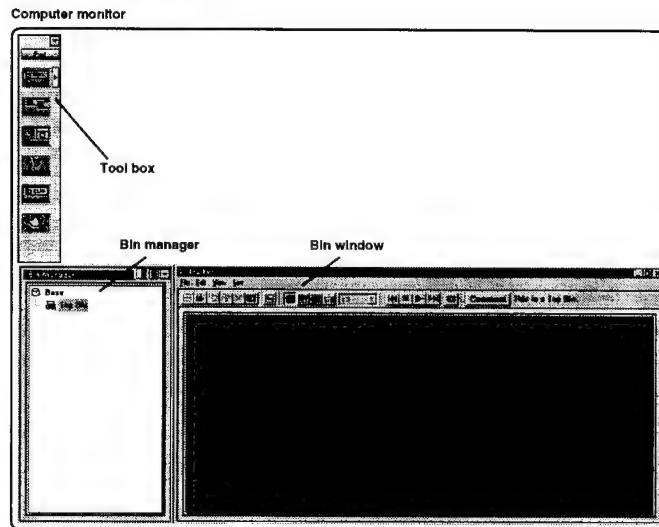
For details on video and audio uploading, editing and other operations, refer to the Reference Manual.  
(The Reference Manual is handled by Matsushita Communication Industrial Co., Ltd Broadcast System Division.)

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## System Startup and Exit

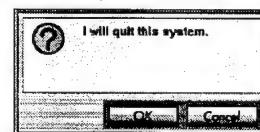
### System Exit

- 1 Click in the tool box. A confirmation panel appears.



- 2 Click if you wish to exit the system. The Windows NT screen now appears.

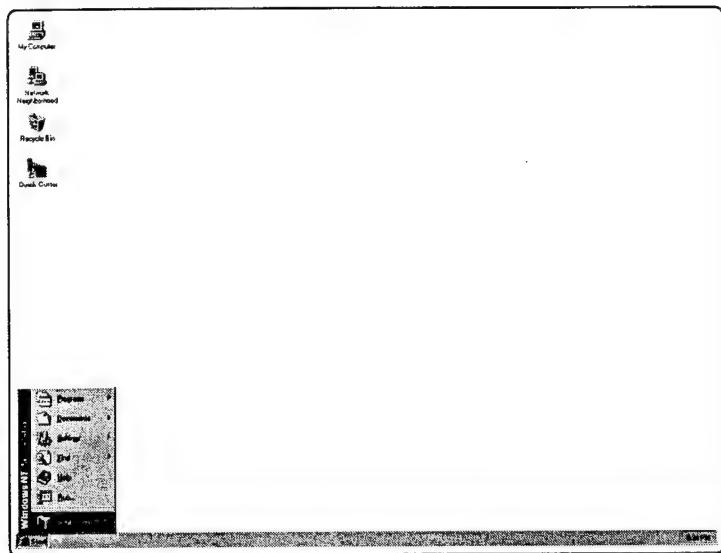
Confirmation panel



E - 17

## System Startup and Exit

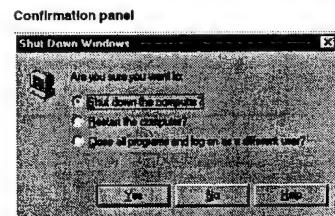
Computer monitor/Windows NT exit screen



3 Click Windows NT "Shut Down."  
A confirmation panel now appears.

4 Select the exit method and click **OK** if you wish to exit Windows NT.

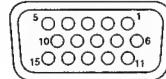
5 First, wait until the "It is now safe to turn off your computer" message appears. Then set the power switches of the peripheral units to OFF and, finally, set the power switch on the main unit to OFF.



## Connector Signals

RGB I/F

Pin No.	Signal
1	CRV
2	CGV
3	CBV
4	un used
5-8	GND
9	un used
10	GND
11	un used
12	DCI Comm
13	- CHSYNC
14	- CVSYNC
15	un used



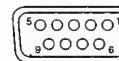
Key board/Mouse

Pin No.	Signal
1	DATA
2	un used
3	GND
4	+5V
5	CLOCK
6	un used



SERIAL 1, 2

Pin No.	Signal
1	CD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	CI



SCSI S1 CHA, B

Pin No.	Signal	Pin No.	Signal
1-12	GND	49	GND
13	OPEN	50	TERM SENSE
14-16	GND	51, 52	TERM POWER
17, 18	TERM POWER	53	RESERVED
19	RESERVED	54	GND
20-34	GND	55	- ATN
35	- DB (12)	56	GND
36	- DB (13)	57	- BSY
37	- DB (14)	58	- ACK
38	- DB (15)	59	- RST
39	- DB (P1)	60	- MSG
40	- DB (0)	61	- SEL
41	- DB (1)	62	- C/D
42	- DB (2)	63	- REQ
43	- DB (3)	64	- I/O
44	- DB (4)	65	- DB (8)
45	- DB (5)	66	- DB (9)
46	- DB (6)	67	- DB (10)
47	- DB (7)	68	- DB (11)
48	- DB (P)		



## Error Items

### When the AUTO OFF lamp is lit

Description	VTR operation (Restart condition)
If the capstan motor speed is abnormally low, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If an abnormal tension at the supply side is detected in the capstan mode, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If condensation is detected, the AUTO OFF lamp lights, and the VTR is transferred to the eject mode. After the tape is ejected, the drum rotates in order to eliminate the condensation. When the condensation has been eliminated, the AUTO OFF lamp goes off, and the VTR can be used.	EJECT
<b>&lt;Notes&gt;</b>	
• If condensation is detected in the eject mode, the drum starts rotating as soon as it is detected. • If condensation is detected when the cassette has been inserted, the drum rotation is stopped, and after the tape is ejected, the drum starts rotating.	
If the cylinder motor speed is abnormally high, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the cylinder motor speed is abnormally low, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the tape start and tape end are detected simultaneously either during or after loading, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
The AUTO OFF lamp lights when the take-up reel has been rotating idly for a fixed period of time while the start/end processing operation during loading (half position) is being performed.	STOP (POWER OFF → ON)
If the cassette does not move up even when 6 seconds have elapsed since the VTR was transferred to the eject mode, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
<b>&lt;Note&gt;</b>	
If the cassette does not move down inside the machine even when 6 seconds have elapsed since the cassette was inserted, the VTR is transferred to the eject mode.	
When the unloading operation is not completed within 10 seconds, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
<b>&lt;Note&gt;</b>	
When the loading operation is not completed within 6 seconds, the VTR is transferred to the eject (unloading) mode.	
If the reel motor at the take-up side is running in the reverse direction, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If an abnormal tension at the supply side is detected in the reel mode, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
When the servo microcomputer does not follow the instructions of the system control microcomputer even when 10 seconds have elapsed, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)

## Error Items

### When the AUTO OFF lamp is lit

Description	VTR operation (Restart condition)
When there is no response from the servo microcomputer for 1 or more seconds, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
When only the servo microcomputer was reset in an instantaneous power failure, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the start/end processing operation is not completed, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the supply reel motor should rotate at an abnormally fast rate, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If an abnormal torque applied to the supply reel motor is detected or if an abnormal current flowing to the current-sensing resistor is detected, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the take-up reel motor should rotate at an abnormally fast rate, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If an abnormal torque applied to the take-up reel motor is detected, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If the tape has not been wound up during unloading, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If, after the total tape amount has been detected, the amount of tape wound up on the take-up reel and the amount of tape supplied by the supply reel differ to an abnormal extent while the tape is travelling in the forward or reverse direction, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
If, after the cassette has been inserted, the tape take-up reel has not wound up the tape while the total tape amount is not detected and while the tape is travelling in the forward or reverse direction, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)
When the loading operation is performed while the cassette lid is not open, the AUTO OFF lamp lights.	STOP (POWER OFF → ON)

### When the WARNING lamp is lit

Description	Check item
When it is detected that the fan motor has stopped operating, the WARNING lamp lights.	Check the fan motor. If the fan motor has stopped operating, restart it.
When it is detected that the servo lock has become disengaged while the tape is travelling during $\times 4$ speed tape playback, the WARNING lamp lights.	Check the status of the tape recording.
When an unrecorded part is played while the tape is travelling during $\times 4$ speed tape playback, the WARNING lamp lights.	Check the status of the tape recording.

## ***Maintenance and Care***

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- In order to deliver a high performance, this unit contains some precision-made mechanisms. To keep the unit in perfect working order for as long as possible, remember to maintain and take care of this machine. Lubrication, parts replacement, electrical component adjustment and servicing all require sophisticated technology and equipment. Do not attempt to do any of these activities yourself but consult with your dealer and follow the recommendations given.
- Failure to remove dust and dirt accumulated inside the unit, replenish the lubricating oil, replace worn parts (heads, etc.) and otherwise inspect and maintain your unit will not only make it impossible to achieve good-quality pictures and proper recordings but will also shorten the unit's service life. It is recommended that maintenance and inspections be performed as soon as they are required.

### **Video head Cleaning**

This unit has an auto head cleaning function which automatically reduces the dirt on the heads. However, to further increase the unit's reliability, it is recommended that its video heads be cleaned every day. Use the cleaning fluid designated by Panasonic.

### ***Condensation***

---

Condensation occurs due to the same principle involved when droplets of water form on a window pane of a heated room. It occurs when the unit or tape is moved between places where the temperature or humidity varies greatly or when, for instance:

- It is moved to a very humid place full of steam or a room immediately after it has been heated up.
- It is suddenly moved from a cold location to a hot or humid location.

1-10

When moving the unit to locations such as these, leave it standing for about 10 minutes rather than switching on the power immediately.

If condensation has formed on or in the unit, the AUTO OFF lamp lights and the cassette tape is automatically ejected.

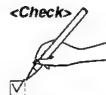
Keep the power supplied and simply wait until the AUTO OFF lamp goes off.

## Chapter 1 Do these first!

This chapter explains the procedures (setup) to prepare the purchased unit for operation and the cautions to be heeded.

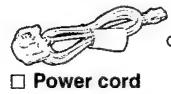
1-1. Checking the accessories and attaching the stabilizer	E - 3
1-2. Checking the AC supply voltage and precautions	E - 5
1-3. Cable connection precautions (rear panel)	E - 5
1-4. Connecting the peripheral devices and layout precautions	E - 6

### 1-1. Checking the accessories and attaching the stabilizer feet

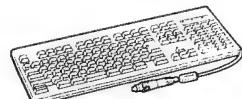


Before proceeding with the connections, check that all the accessories shown below are present and accounted for.

Do not subject the supplied mouse, keyboard or cables to strong bumps or shocks. Doing so could damage them.



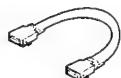
Power cord



Keyboard



Mouse



D-SUB 60-pin cable



VGA cable



Stabilizers (x4)  
 mounting screws (x8)



Installation manual  
(which you are now reading)



Operating  
instructions



Warranty card



Ferrite cores (x4)

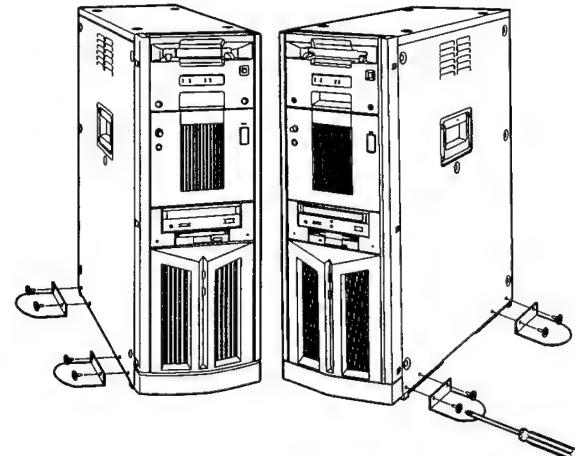
When the SCSI hard disk drive for external expansion purposes is to be connected, attach one ferrite core to one end of the SCSI I/F cable and the other one to the other end.

E - 3

### Attaching the stabilizer feet

#### CAUTION:

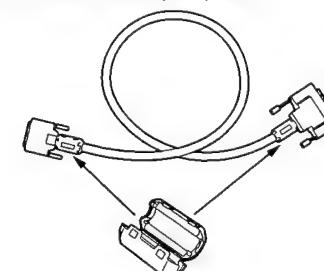
To reduce the risk of injury due to tipping over,  
Mount the stabilizers before installation.



### Attaching the ferrite cores

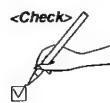
When the SCSI hard disk drive for external expansion purposes is to be connected, one of ferrite cores packed with the unit must be attached to one end of the SCSI I/F cable and the other one must be attached to the other end.

It is recommended that the cable shown below be used as the SCSI I/F cable.  
• Model No. ACK/M-WP made by Adaptec Inc.



E - 4

## 1-2. Checking the AC supply voltage and precautions



Use a AC voltmeter or other instrument to check that the supply voltage at the installation location is inside the following range:

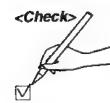
- 220 V ~ 230 V ±10 %

**Note:**

Not only may the unit fail to operate properly if it has been started up with a supply voltage outside the above range but the software programmes and data pre-installed on the system hard disk inside the unit may be destroyed as well.

Use of an uninterruptible power supply system is recommended if the unit is to be used in unsatisfactory power supply conditions. For details, consult with your dealer.

## 1-3. Cable connection precautions (rear panel)



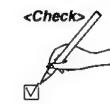
Bear in mind the points listed below when connecting the accessory cables to the unit's rear panel. It is recommended that you proceed while referring to the rear panel connection diagram in the Operating Instructions. (Refer to page E-12 of Operating Instructions.)

- Connect the VGA cable.  
The VGA has an up end and a down end. Make absolutely sure that the up connector is connected to the monitor of the personal computer.
- Secure the VGA cable connectors using the screws.
- Connect the D-SUB 60-pin cable.
- Connect the D-SUB 60-pin cable connectors using the screws.
- Connect the keyboard.
- Connect the mouse.
- Check the names of the connectors on the rear panel to verify that the keyboard has not been connected to the mouse connector or the mouse has not been connected to the keyboard connector.
- Connect the power cord to the socket on the main unit.
- Secure the power cord using the clamp.
- Refrain from connecting the power plug to the power outlet at this stage.

**CAUTION:**

The socket-outlet shall be installed near the equipment and shall be easily accessible.

## 1-4. Connecting the peripheral devices and layout precautions



Bear in mind the points listed below when connecting the computer monitor, monitor (video) for mounting the pictures and other peripheral devices to the unit. It is recommended that you proceed while referring to the rear panel connection diagrams in the Operating Instructions. (Refer to pages E-13 to E-15 of Operating Instructions.)

For details on the handling of peripheral devices, refer to the operating instructions accompanying each device concerned.

- Connect the peripheral devices while power to the unit and peripheral devices is off.  
Do not move the unit while the power is still on.
- Before moving the unit, turn its power off.  
Do not move the unit while the power is still on.
- Install the unit in a flat and stable location.
- At the installation stage, ensure that the connectors and cables protruding from the unit's rear panel do not make contact with any objects in the vicinity.
- At the installation stage, do not drop the keyboard or mouse, and take care not to run their cables underneath the unit or peripheral devices.
- Do not place objects on top of the unit.
- Leave a sufficient clearance around the unit in order to improve the ventilation inside the unit.
- Do not place food or drinks in the vicinity of the unit.  
Morsels of food or spilled drinks can cause trouble.
- Check that you have not forgotten to connect the VGA cable between the unit and the monitor for the computer.
- Check that you have not forgotten to connect the video cable between the unit and monitor (video) for mounting the pictures.
- Check that you have not forgotten to connect the unit and any other peripheral devices.
- Check that all the devices required have been connected, and insert the power plugs of the unit and peripheral devices into the power outlets.
- When the SCSI hard disk drive for external expansion purposes is to be connected:  
Attach one of the ferrite cores packed with the unit to one end of the SCSI I/F cable and the attach the other one to the other end.

## Chapter 2 Power startup checks and AV disk inspections (1)

This chapter explains the checks that must be conducted on the basic hardware settings and basic inspections of the AV disks after the unit's power switch has been set to the ON position.

When conducting the checks and inspections described in this chapter, do not turn off the power or reset the system unnecessarily. Doing so may change or destroy the pre-installed software programmes or data.

For details on turning off the power and resetting the system, refer to the descriptions given for the items concerned.

2-1. Checking the power startup .....	E - 7
2-2. Checking the SCSI device settings .....	E - 9
2-3. AV disk inspections (1) .....	E - 11

### 2-1. Checking the power startup

When the unit's power switch is set to ON, the unit's basic test is automatically conducted, and its results can be checked out by beep tones and displays which appear on the computer monitor.

After the power switches of the computer monitor, monitor (video) for mounting the pictures and other peripheral devices have been set to ON, set the unit's power switch to ON and conduct the checks described below at startup.

If trouble has been detected as a result of conducting the checks, refer to the "Troubleshooting" section in the Operating Instructions. (Refer to pages E-19 to E-26 of the Operating Instructions.)

Since it takes very little time to check the displays on the computer monitor, you will find it easier to perform the checks if you quickly glance through the whole of this section and the BIOS screen displays in Appendix A (pages E-38 to E-42) and understand what is involved.

For details on how to adjust the monitor and otherwise handle any of the peripheral devices, refer to the operating instructions accompanying each device concerned.

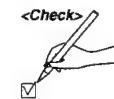
**Note:**

If a monitor display which should have been checked during startup has been overlooked, the unit must be rebooted so that it can be checked.

**Under no circumstances must the power be turned off or the system reset while white characters appear on a blue background during startup.**

Wait until the Windows NT flag appears, and then reboot the unit using the system reset switch on the unit's front panel.

### Checking the LEDs on the unit's front panel



Check that the two disk access lamps light up and flash when the power is turned on.

### Checking the computer monitor displays (BIOS start screen) during startup



Is the memory size value (standard 64 MB) correct?  
 Did the CD-ROM drive name appear (for an instant)?  
 Did the name of the system hard drive appear?  
    (Refer to the BIOS screen displays in Appendix A.)  
 Did the SCSI card name appear?  
    (Refer to the BIOS screen displays in Appendix A.)  
 Did all the SCSI disk names appear?  
    (Refer to the BIOS screen displays in Appendix A.)  
 Did the PCI device list appear?  
    (Refer to the BIOS screen displays in Appendix A.)

## 2-2. Checking the SCSI device settings

In this section the SCSI-BIOS Tool is used to check the SCSI device settings. You will find it easier to perform the checks if, before starting the actual procedure, you quickly glance through SCSI-BIOS Tool items B-1~B-3 (pages E-43 to E-48) in Appendix B and understand how the settings of the parts corresponding to the items to be checked in this section are displayed. In particular, the following parts in B-3 must be understood.

- (1) SCSI device configuration check
- (2) SCSI ID check

If items with different settings have been detected as a result of conducting the checks, refer to the explanation given in

- ◇ When the SCSI device parameters are wrong ◇

which is found in B-3 of Appendix B, and to the "Troubleshooting" section in the Operating Instructions. (Refer to pages E-19 to E-26 of Operating Instructions.)

When the checks in this section have been completed with no errors found, proceed to the next section [2-3. AV disk inspections (1)] without exiting the SCSI-BIOS Tool.

1. After the series of checks described in Section 2-1 (Checking the power startup) have been completed with no errors found, reboot the unit and check the SCSI device settings.

### Note:

If, upon completion of the checks in the previous section, the screen displays during the startup procedure have reached the white characters on a blue background status, do not turn off the power or reset the system until the display status changes.

If either step is to be performed, wait until the Windows flag appears on the screen, and then reboot the unit using the reset switch.

2. Check the SCSI device settings following the instructions in "(1) SCSI device configuration check" and "(2) SCSI ID check" in B-3 (pages E-44, E-45) of Appendix B (SCSI-BIOS Tool).

## SCSI device configuration checks (1) (Conduct the checks for both channels A and B.)



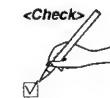
- Check the SCSI Channel Interface Definitions.
- Is the Host Adapter SCSI ID set to "7"?
- Is the SCSI Parity Checking set to "Enable"?
- Is the Host Adapter SCSI Termination set to "Automatic"?

## SCSI device configuration checks (2) (Conduct the checks for both channels A and B.)



- Check the parameters of all the SCSI-ID #0~#15 devices in SCSI Device Configuration.  
(Check that the parameters of all the devices are set as shown below.)
- Is the Initiate Sync Negotiation set to "yes"?
- Is the Maximum Sync Transfer Rate set to "40.0"?
- Is the Enable Disconnection set to "yes"?
- Is the Initiate Wide Negotiation set to "yes"?
- Is the Send Start Unit Command set to "no"?
- Is the BIOS Multiple LUN Support set to "no"?
- Is the Include in BIOS Scan set to "yes"?

## SCSI ID checks (Conduct the checks for both channels A and B.)

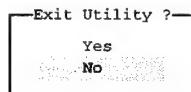


- Does "AHA-3940AU/AUW/AUWD" appear for SCSI ID #7?

### 2-3. AV disk inspections (1)

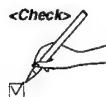
In this section, the AV disks are inspected using the SCSI-BIOS Tool. These inspections check for defects in the AV disks as recording media. (It takes about an hour to conduct all the inspections in this category.)

1. To return the screen display to the inspection menu selection, press the [Esc] key several times until the message box shown below is displayed.



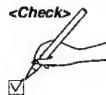
2. After selecting [No], press the [Enter] key, follow the displays and return the device channel (channel A, B) selection screen.
3. Inspect the disks following the instructions on "(3) Inspecting the disk media" in B-3 (pages E-46, E-47) of Appendix B (SCSI-BIOS Tool).

#### Channel A SCSI disk checks



- Did "Verify Disk" of the SCSI ID #0 disk end with "Disk Verification Complete"?
- Did "Verify Disk" of the SCSI ID #1 disk end with "Disk Verification Complete"?
- Did "Verify Disk" of the SCSI ID #2 disk end with "Disk Verification Complete"?

#### Channel B SCSI disk checks



- Did "Verify Disk" of the SCSI ID #0 disk end with "Disk Verification Complete"?
- Did "Verify Disk" of the SCSI ID #1 disk end with "Disk Verification Complete"?
- Did "Verify Disk" of the SCSI ID #2 disk end with "Disk Verification Complete"?

4. If all the disks have been inspected with no errors found, refer to B-4 (page E-48) in Appendix B, and exit the SCSI-BIOS Tool.

This chapter describes the checks on the disk-related settings which are conducted on the startup screen of Windows NT, the operating system used by the unit, and the inspections conducted on the AV disks to verify whether they can be used by this system. The inspections described in this chapter are conducted after the Windows NT startup screen appears normally after the power to all the units and devices has been turned on. For details on the checks and inspections conducted prior to the appearance of the Windows NT startup screen, refer to Chapters 1 and 2 of this manual.

3-1. Checking the disk settings .....	E – 12
3-2. Checking the SWAP area settings .....	E – 14
3-3. Checking the Audio & Title directories .....	E – 16
3-4. AV disk inspections (2) .....	E – 17

#### 3-1. Checking the disk settings

The checks in this section are performed after the series of checks described in the previous chapter have been completed with no errors found. When the sequence of power startup steps is completed and the waiting-to-log-on dialog box has appeared on the screen, follow the instructions in the box and complete the logging on procedure for Windows NT.

On the startup window after Windows NT log-on, check the disk settings in this section using the Disk Administrator which is a Windows NT management tool. Before starting the actual procedure, you will find it easier to perform the checks if you quickly glance through items C-1-C-3 (pages E-49, E-50) of Appendix C which describe how to inspect the HDD using the Disk Administrator provided with Windows NT and understand how the settings of the parts corresponding to the items to be checked in this section are displayed.

If items with wrong settings have been detected as a result of conducting the checks, refer to the explanations with the  $\diamond$  marks in the sections concerned in Appendix C and to the "Troubleshooting" section in the Operating Instructions. (Refer to pages E-19 to E-26 of Operating Instructions.)

- Start up the Disk Administrator following the instructions in C-2 (page E-49) of Appendix C.

**Disk volume-related status information check using the Disk Administrator**

*<Check>*

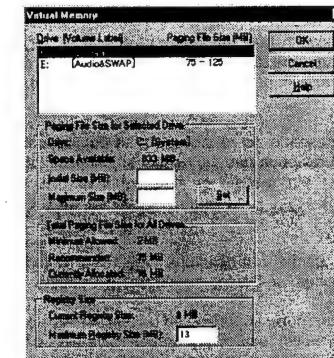
- Are 7 disks (excluding the CD-ROM) displayed altogether?
- Is one CD-ROM drive displayed?
- Is the name of the disk 0 drive set to "C:?"
- Is the format of disk 0 set to "NTFS"?
- Is "free space" displayed for disk 1?
- Is "free space" displayed for disk 2?
- Is the name of the disk 3 drive set to "E:?"
- Is the format of disk 3 set to "NTFS"?
- Is "free space" displayed for disk 4?
- Is "free space" displayed for disk 5?
- Is "free space" displayed for disk 6?
- Is the name of the CD-ROM drive set to "D:?"

When the checks in this section have been completed with no errors found, exit the Disk Administrator following the instructions in C-6 (page E-55) of Appendix C, and proceed to the next section (3-2. Checking the SWAP area settings).

**3-2. Checking the SWAP area settings**

In this section, the Windows NT system settings are checked from the control panel on the Windows NT startup screen. If there is an application now starting up in Windows NT, exit the application and start the procedure from the Windows NT startup screen.

- On the [Start] menu, click [Settings (S)] → [Control Panel (C)] to open the control panel.
- Double-click the [System] icon to open the system properties.
- Select the [Performance] tab.



- Click the [Change (C)] button of the Virtual Memory item to open the virtual memory window.
- Use the mouse to click the drive "E:" line inside the list box at the top of the window.

**Note:**  
Drive "C:" is selected in the figure shown above.

**Check that the values shown below appear in the Initial Size and Maximum Size setting columns of "Paging File Size of Selected Drive."**



- Paging file size of drive "E:" is Initial Size 75 MB?
- Paging file size of drive "E:" is Maximum Size 125 MB?

If an item with a wrong setting is discovered as a result of the check, check the explanation under "When an item with a wrong setting is discovered" below.

- When the checks in this section have been completed with no errors found, click [OK] → [Close], close the Virtual Memory window, close the Control Panel, return to the Windows NT startup window, and proceed to the next section (3-3. Checking the Audio & Title directories).

◇ **When an item with a wrong setting is discovered** ◇  
(This part can be skipped if the check results are normal.)

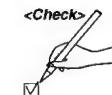
- Use the mouse to click the drive "E:" line inside the list box at the top of the Virtual Memory window.
- Input the values shown below in the Initial Size and Maximum Size setting columns of "Paging File Size of Selected Drive," and click the [Setting] button.  
Initial Size (MB) : "75"  
Maximum Size (MB) : "125"
- Return to the list box at the top of the window, and click the drive "C:" line.
- Input the values shown below in the Initial Size and Maximum Size setting columns of "Paging File Size of Selected Drive," and click the [Setting] button.  
Initial Size (MB) : "0"  
Maximum Size (MB) : "0"
- When the [OK] → [Close] button is clicked, the dialog box prompting the user to reboot the system appears. Proceed to reboot the system.

### 3-3. Checking the Audio & Title directories

In this section, the Windows NT Explorer is used to check the making of the Title and Audio directories on the Windows NT startup screen.

- If there is an application now starting up in Windows NT, exit the application and start the procedure from the Windows NT startup screen.
- On the [Start] menu, click [Program] → [Windows NT Explorer] to start.
- Click the Audio & SWAP(E:) drive under My Computer on the left side of the divided window.

Check the names of the directories which appear in the right side of the divided window.



Does the Title directory (E:\Title) appear for drive "E:"?  
 Does the Audio directory (E:\Audio) appear for drive "E:"?

- When the checks in this section have been completed with no errors found, click  at the top right of the Explorer window, exit the Windows NT Explorer, and return to the Windows NT startup screen.

## Chapter 4 Checking operation using the pre-installation programme

### 3-4. AV disk inspections (2)

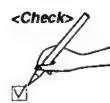
In this section, the Disk Administrator, which is a Windows NT management tool, is used to check the status of the unit's AV disks as recording and playback media.

Before starting the actual procedure, it is recommended that you quickly glance through section C-4 (pages E-51, E-52) of Appendix C (HDD inspection methods using Disk Administrator provided with Windows NT) so that you understand the operation method for the parts corresponding to the items to be checked in this section.

(It may take about an hour to conduct all the inspections.)

If errors have been detected on the AV disks as a result of conducting the checks, refer to the explanations with the  $\diamond$  marks in the sections concerned in Appendix C and to the "Troubleshooting" section in the Operating Instructions. (Refer to pages E-19 to E-26 of Operating Instructions.)

When the checks in this section have been completed with no errors found, exit the Disk Administrator following the instructions in C-6 (page E-55) of Appendix C, and proceed to Chapter 4.



Were the checks completed without error for disk 3?

This chapter explains after the unit has been installed how to conduct comprehensive operation checks on the hardware of the unit using the limited edition of the editing software programme which is pre-installed in the unit.

#### Note:

Do not install the editing programme until the checks described in this chapter have been completed. Otherwise, it may no longer be possible to run the limited edition of the programme which was pre-installed.

After the power to the unit has been turned on, wait until the Windows NT startup screen has appeared without any problem. It is only after this that all the checks described in this chapter are to be performed. For details on the checks and inspections before this screen appears, refer to Chapters 1 and 2 of this Manual.

When an external VTR is to be used, connect the external input and output devices to both the component and composite connectors before starting the checks.

4-1. Checking the uploading operation .....	E - 18
4-2. Check the editing functions .....	E - 26
4-3. Save the video sequence .....	E - 30
4-4. Checking the downloading operation .....	E - 32

### 4-1. Checking the uploading operation

Proceed with the checks in this section after the series of checks described in the previous chapters have been completed with no errors found.

In this section, the limited edition of the pre-installed editing software programme is used to check the uploading operation on the startup screen which appears after Windows NT log-on.

If errors have been detected in the settings as a result of conducting the checks, refer to the explanations enclosed within the  $\diamond$  marks in the sections concerned in Appendix C and to the "Troubleshooting" section in the Operating Instructions. (Refer to pages E-19 to E-26 of Operating Instructions.)

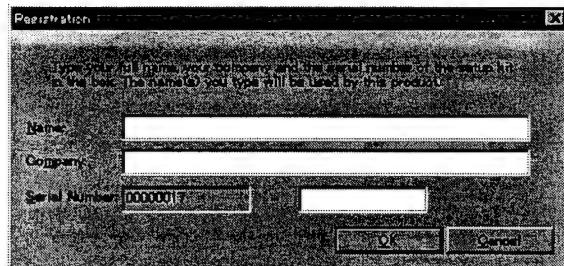
When the checks in this section have been completed with no errors found, exit the Disk Administrator following the instructions in C-6 (page E-55) of Appendix C, and proceed to the next section (4-2. Check the editing functions).

1. Double-click the Quick Cutter (Limited) icon (shown below) on the Windows NT startup screen to start the limited edition of the editing software programme.  
(It may take more than ten seconds or so for the screen to appear.)

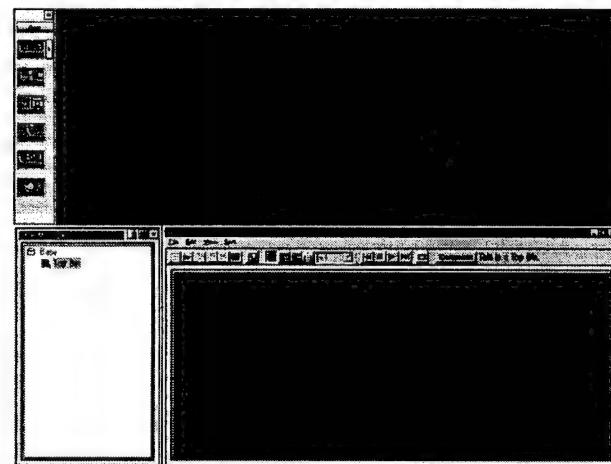


2. When the registration dialog box shown below appears, input the character strings given below in the list boxes, and close the dialog box using the [OK] button.

Name : VSD  
 Company : Panasonic  
 Serial Number : 00000017-1234



Has the startup of the limited edition of the editing software programme resulted in the appearance of the following screen?



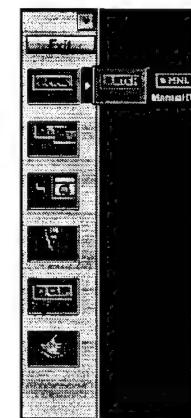
The VTR control panel is started up from the Toolbox at the top left of the screen.

3. Use the icon below the  button to start up.

This icon is used to switch between the two icons shown in the figure on the left. If the icon is , click the  mark at the left of the icon and click the  icon.

4. Double-click the  icon below the  button.

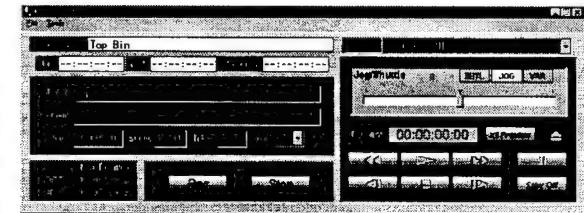
The Manual Digitizer window is now opened, and the VTR control panel appears.



VTR control panel checks

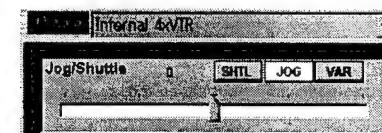


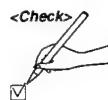
Has the VTR control panel shown in the figure below appeared?



The list box for selecting devices occupies the right half of the VTR control panel.

The VTR device to be controlled can be changed by changing the Device.





"Internal 4xVTR" displayed as the Manual Digitizer device?

5. If "Internal 4xVTR" is not displayed as the device, click the mark at the far right of the list box to display the device list, and select Internal 4xVTR which is the unit's built-in VTR.
6. Insert the DVCPRO tape with prerecorded images into the unit's built-in VTR, and wait for its loading to be completed.
7. Use the VTR function buttons on the VTR control panel to play the tape inside the built-in VTR.  
The area of the VTR control panel shown below contains the VTR function buttons.  
When one of these buttons is clicked by the mouse, the corresponding operation is performed.



Did the mark go green when the was clicked?

Was  $\times 4$  speed playback started by the built-in VTR when the button was clicked?  
The playback output of the built-in VTR can be checked visually on the monitor (video) for mounting the pictures.

When the prerecorded tape is played back normally, were the  $\times 4$  speed playback images of the built-in VTR affected by noise or disturbances?

Was the sound played at the  $\times 4$  speed?  
Noise can be heard.

Once it is confirmed that the built-in VTR's tape is played back properly at the  $\times 4$  speed, the checking of the uploading operation can proceed.

The area of the VTR control panel shown below contains the uploading function buttons.



8. When the built-in VTR is set to the  $\times 4$  speed play mode and the button is clicked, uploading of the built-in VTR's playback data to the built-in AV disk is commenced.
9. Click the button to end uploading.
10. An icon of the clip which has just been uploaded is automatically created by clicking the button, and it is newly registered in the bin.
11. When the button is clicked while the built-in VTR's tape is still playing at the  $\times 4$  speed, the next uploading is commenced, it is ended by clicking the button, and the icon of the new clip is automatically registered in the bin.
12. By repeating this procedure, a multiple number of clips are uploaded onto the AV disk.

When all the clips have been uploaded, be sure to end the  $\times 4$  speed playback of the built-in VTR's tape, and eject the tape.  
The built-in VTR's stop button is located in the area of the VTR control panel shown below.



13. The built-in VTR stops when the button in the above figure is clicked.
14. The tape is ejected by clicking the button on the right side of the button.

### Precautions when checking the uploading operation

Some limited editions of the editing software programme restrict the amount of the data recorded onto the AV disk to a maximum of 10 minutes. An error may occur when an attempt is made to capture a clip with a long recording time. Some limited editions restrict the number of clips which can be continuously captured during uploading to 5. To check the uploading operation, it is recommended that the length of each clip be kept short and that the number of clips be limited to 5.

**Example:** Length of clip = approx. 1 minute  
(Actual time taken to upload = approx. 15 sec.)  
Number of clips to be uploaded = 4 or 5

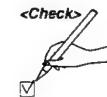
Refrain from clicking any area except the Manual Digitizer window while the uploading operation is being checked. Otherwise, the monitor (video) for mounting the pictures output may be switched, and it may no longer be possible to check the uploading operation properly.



- Did the letters "REC" go green when the  button was clicked?
- Was the green colour of the letters "REC" of the  button cleared when the  button was clicked?
- Was the icon for the uploaded clip registered in the bin when the  button was clicked?
- Was the green colour of the  mark of the  button cleared when the built-in VTR's  button was clicked after all the clips were uploaded?
- Did the built-in VTR stop the  $\times 4$  AV playback output when the built-in VTR's  button was clicked?  
The playback output of the built-in VTR can be checked visually on the monitor (video) for mounting the pictures.

This completes the checks on the uploading operation of the built-in VTR. The playback of the uploaded data is now checked.

15. Click the title bar of the bin window to activate the bin window.

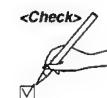


- Was the bin window title bar selected when it was clicked?

16. The uploaded data can be played by inputting the space key after the clip registered in the bin has been clicked (selected).

17. Check the clip's playback images on the monitor (video) for mounting the pictures.

18. Playback automatically stops at the end of the selected clips.  
To stop playback at any time, input the space key again.



- Were the clips registered in the bin selected when they were clicked?
- Was the selected clip played (at  $\times 1$  speed) when the space key was pressed?
- Did the selected clip stop playing when the space key was pressed again?
- Was the playback AV of the selected clip affected by noise or disturbances?  
All the playback images of the clips are checked on the monitor (video) for mounting the pictures.

This now completes the checks on the built-in VTR for the uploading and downloading operations.

In the case of a system in which an external VTR is connected, return the VTR control panel checks (page E-20), set the display device to External VTR1 or External VTR2, and conduct the checks described up to this point in exactly the same way as with Internal 4xVTR.

The uploading is simply set to  $\times 1$  speed, and the operations and procedures are the same.

#### Prior checkpoints for uploading using an external VTR



- Has the RS-422A cable been properly connected between the unit and external VTR?  
For details on the connection method, refer to the user's manuals.
- Has remote control been enabled for the external VTR?  
For details on the setting, refer to the user's manual of the external VTR.
- On the unit and on the VTR control panel of the limited edition of the editing software programme, is the external VTR connected (External VTR1 or External VTR2) set as the Device?

19. When the checks (only if required) on the uploading operation using the external VTR have been completed with no errors found, click  at the top right of the Manual Digitizer window, and close the VTR control panel.

Do not exit Toolbox since the limited edition of the editing software programme will be used in the next section as well.

#### 4-2. Checking the editing functions

Proceed to check the editing operations using the same limited edition of the editing software programme which was used in the last section. Upload several clips to the AV disk in advance to use in checking the operations.

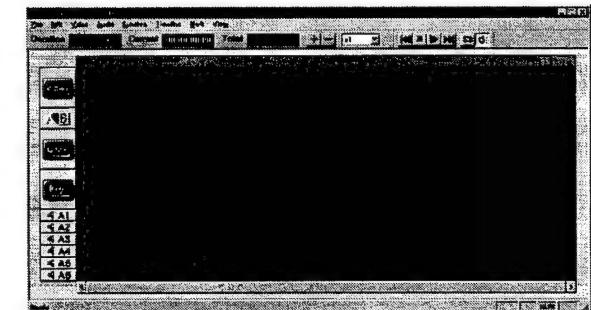
If the clips registered in the bin have been erased, return to the previous section (4-1.), create several fresh clips and play them back to check that no noise or disturbances are present.



The Toolbox sequence editor is used to check the editing operations.

1. To start the sequence editor, double-click the second icon [SeqEditor] below the  button. It may take a few seconds for the sequence editor to start.

The screen shown below appears when the sequence editor starts.





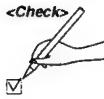
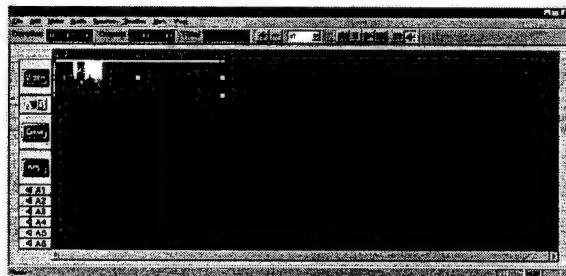
Did the sequence editor screen appear when the [SeqEditor] icon was double-clicked?

- When the sequence editor has started, drag and drop the clips registered in the bin onto the video track, and create the video sequence.



The video track is indicated by the display shown in the figure on the left at the far left of the tracks.  
Use the mouse cursor to select a clip registered in the bin, drag it onto the video track and drop it.

The length of the dropped clip is indicated by a proportionately long rectangle, and the clip icon appears at the far left of the rectangle. The figure below shows an example of the display.



Was it possible to drag and drop the clip on the video track?

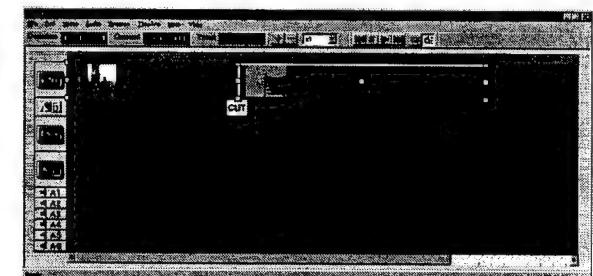
- In the same way, drag and drop several clips on the video track and create the video sequence.  
The clips on the video tracks are automatically colour-coded.



When a clip extends beyond the sequence editor screen, click the "+" or "-" button at the top of the window to change the time axis. The displayed length of a clip can be shortened using the "-" button.

A video sequence created by only drag and drop procedures is automatically set to the cut editing mode.  
The clips are automatically positioned without gaps, and the [cut] mark appears at each join.

The figure below shows an example of the display of a video sequence consisting of two clips.



Was it possible to drag and drop several clips on the video track?  
 Did the [cut] mark appear at each join between the clips as shown in the figure above?

After creating the video sequence, play it back and check it.



The sequence is played back using the function buttons (shown on the left) located at the top of the sequence editor window.

4. Click the button to move the play start position to the beginning of the video sequence.
5. Click the button to start playing the video sequence.
6. The playback images are now output to the monitor (video) for mounting the pictures.
7. The cursor appears on the video track to indicate the current playback position while the video sequence is being played.
8. Playback is automatically ended at the end of the video sequence.
9. Click the button to suspend playback at any time.



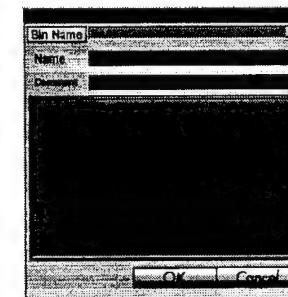
Did the playback of the video sequence start when the button was clicked?  
 Did the playback of the video sequence stop when the button was clicked?  
 Was there any noise or disturbances in the playback AV of the video sequence?  
 Check the playback images visually on the monitor (video) for mounting the pictures.

This completes the editing operation checks.

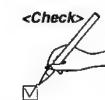
### 4-3. Save the video sequence

Save the created video sequence after the editing operation checks have been completed. Save it in a file by proceeding from the menu bar of the sequence editor.

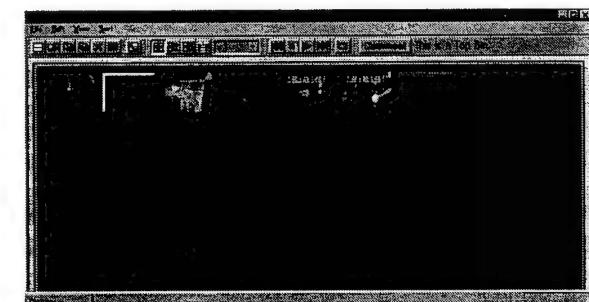
1. Select [Save As...] from the [File] menu from the menu bar of the sequence editor.



2. The dialog box for inputting the filename is now opened (see figure above) so input the name of the file in which the sequence is to be saved. The figure above shows an example where "TEST" was input as the filename.
3. When the button is clicked, the created video sequence is stored under the filename "TEST" which was input, and the sequence icon for the "TEST" filename is registered in the bin.



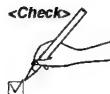
Was the sequence icon registered in the bin when the video sequence was saved?



4. Exit the sequence editor once the file has been saved.  
Click the  mark at the top right of the sequence editor window to close the window.



The "Edit" mark of the sequence icon registered in the bin is cleared when the sequence editor is exited.  
The figure on the left shows an example of a sequence icon without the "Edit" mark.



- Was the sequence editor exited?
- Was the "Edit" mark of the sequence icon registered in the bin cleared when the sequence editor was exited?

This now completes the editing operation checks of this section.  
Do not exit the Toolbox since the limited edition of the editing software programme will be used in the next section as well.

#### 4-4. Checking the downloading operation

Proceed to check the downloading operations using the same limited edition of the editing software programme which was used in the previous sections. The video sequence created in advance by the sequence editor is used to check these operations.

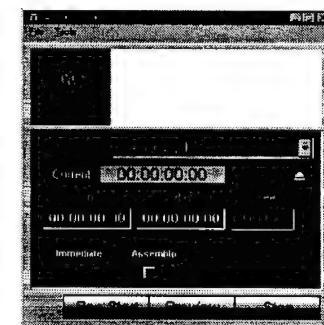
If the video sequence created by the sequence editor has been erased, return to the previous section (4-2.), and create it again. Play it back to check that no noise or disturbances are present.

Load a cassette on which the tests can be recorded into the unit's built-in VTR before proceeding.



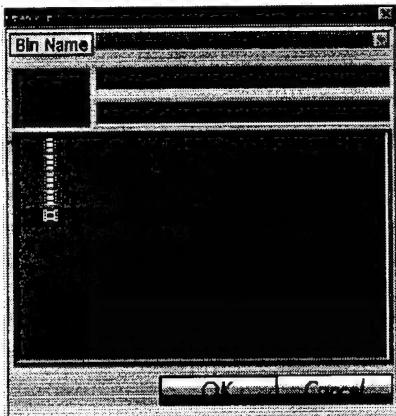
The Toolbox "Record To Video" tool is used to check the downloading operations.  
To start this tool, double-click the third icon [Record To V.] under the  button.  
(See figure on the left)

1. The [Record To Video] window (see figure below) appears by double-clicking the [Record To V.] icon.



- Did the [Record To Video] window appear when the [Record To V..] icon was double-clicked?

2. Select [Open clip] from the [File] menu on the [Record to Video] Window. The [Open clip] window now appears, and the clips registered in the bin and video sequence name appear in the list box. (See figure below)

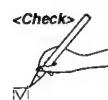


Did the [Open clip] window appear?

3. Click the name of the video sequence (created in 4-2.) used to check the downloading from the [Open clip] window list box, and set it to the "selected colouring" status.

4. Click the [OK] button and close the [Open clip] window.

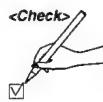
If the next dialog box is displayed, click the [Yes] button.



Was the name of the video sequence selected on the [Open clip] window registered in [Name] on the [Record To Video] window?

This completes the registration of the video sequence for downloading.

After checking that the tape for recording the tests has been loaded into the unit, proceed with the other settings on the [Record To Video] window.



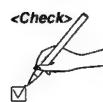
Was a tape on which the tests can be recorded loaded into the unit's built-in VTR?

Does the Device display show [Internal 4xVTR]?



5. If [Internal 4xVTR] is not displayed as the Device on the [Record To Video] window, click the  mark at the far right of the list box to display the device list, and select [Internal 4xVTR] which is the unit's built-in VTR.

6. Select (click) [Immediate] of the selector buttons (see figure below) which indicate the recording mode selection on the [Record To Video] window.

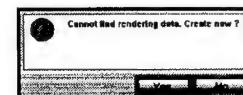


Is the [Immediate] recording mode selector button now highlighted?

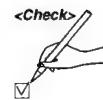
7. Click the  Start button to start the downloading.



If the next dialog box is displayed, click the [Yes] button.



The images can be checked on the monitor (video) for mounting the pictures while they are being downloaded. When downloading is completed, the  Start button highlighting is released.



Did the highlighting of the letters of the  Start button come on when the button was clicked to start the downloading?

Did the images of the downloaded video sequence appear on the monitor (video) for mounting the pictures?

Was it possible to confirm that the highlighting of the letters of the  Start button was released?

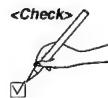
If no problems were encountered above, it means that downloading was completed successfully.

Next, play back the tape with the downloaded images, and check the results of the recording.

Check the downloading results by uploading the downloaded AV data again, and visually checking the playback AV of the AV disk data.

**Notes:**

- Even when the tape on which the data was downloaded is played on the built-in VTR, it is possible to check only every other third frame of the recorded data on the monitor (video) for mounting the pictures since the VTR is set to the  $\times 4$  speed playback mode. It is not possible to detect noise or disturbances in the 3 frames in between which cannot be checked.
- Upload the data to an AV disk from which all frames can be played at the normal speed, play back the images and sound, and check.
- Normal speed playback also appears to be possible using the built-in VTR's  $\times 1$ Preview function. However, since the head tracking for the tracks recorded on the tape is not controlled in the  $\times 1$ Preview mode, noise or disturbances may occur during playback even if the data has been recorded properly. Therefore, the preview mode is not suited to checking the results of downloading.
- First, close the [Record To Video] window which you have finished using. Click  at the top right of the window to close the [Record To Video] window.

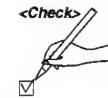


Was the [Record To Video] window closed?

Next, delete the icons for the clips in the bin and the sequence icon so as to free up space on the AV disk for re-uploading the downloading results. First, delete the icon of the video sequence used for downloading. Then delete the clip icons.

The uploaded data is deleted along with the clip icon, and the amount of free space on the AV disk is increased.

- Click the icon of the sequence in the bin, set it to the "selected colouring" status, and press the Delete key. The video sequence is now deleted. The dialog box "Following clips[s] will be deleted," asking whether to go ahead with deletion is now opened. Click the [Yes] (delete) button.
- Click one of the icons of the clips in the bin, set it to the "selected colouring" status, and press the Delete key. The clip icon and its recorded data are now deleted. The dialog box "Following clips[s] will be deleted," asking whether to go ahead with deletion is now opened. Click the [Yes] (delete) button.
- Delete the icons of all the clips in the bin by following the same steps.



Was the icon of the sequence in the bin deleted?  
 Were all the icons of the clips in the bin deleted?

12. After freeing up space on the AV disk by deleting the icons for the clips in the bin and sequence icon, the next step is to re-upload the downloaded data recorded on the tape in order to check the downloading results. Since the uploading procedure is basically the same as that described in section 4-1 (Checking the uploading operations), only the main points will be described here.

For further details, refer to section 4-1 (pages E-18 to E-25).

- Insert the tape with the downloaded data into the unit's built-in VTR, and wait until loading is completed.
- Start [Manual Digitizer] from Toolbox, and set the Device selection on the VTR control panel to [Internal 4xVTR].

15. Operate the built-in VTR using the VTR function buttons, and check the downloaded image start and end points on the tape.

- Check the playback images on the monitor (video) for mounting the pictures, and make a note of the images near the start point and near the end point.

16. Operate the built-in VTR using the VTR function buttons, and stop the tape at a position slightly before the downloaded image start point.

- Find the stop position by checking the playback images on the monitor (video) for mounting the pictures.

17. Click the  button to start playing back the tape at the  $\times 4$  speed, check on the monitor (video) for mounting the pictures that playback of the downloaded images has started, and then click the  button to start the uploading.

**Note:**

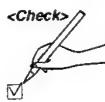
Since downloading was executed in the [Immediate] mode, disturbances may occur in the tape playback tracking at the video start point, and re-uploading may not be performed properly. When starting the re-uploading, be sure to check that the playback of the downloaded images has started, and then click the  button.

18. End the re-uploading by clicking the  button (not the VTR operation  button) near the end of the downloaded images.

19. Click the VTR operation  button to stop the built-in VTR.

This completes the re-uploading procedure.

## Appendix A BIOS screen display



Were the clip icons for the re-uploaded data registered in the bin at the end of the re-uploading (when the upload  button was clicked)?

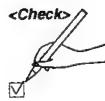
Once it has been confirmed that the new clips have been registered in the bin, play back the re-uploading results, and check that there is no noise or disturbances in the playback AV.

Since disk playback and check procedures are basically the same as those described in section 4-1 (Checking the uploading operations), only the main points will be described here.

For further details, refer to section 4-1 (pages E-18 to E-25).

20. Click the icon of the re-uploaded data clip which has been registered in the bin, and set it to the "selected colouring" status.

21. Input the space key; play back the disk, and check on the monitor (video) for mounting the pictures that the playback AV is free from noise and disturbances.



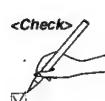
Was there any noise or disturbances in the playback AV of the re-uploaded data?

**Note:**

The downloaded images may be disturbed after the end point.

22. This completes the downloading result check.

Close the [Manual Digitizer] window, click the Toolbox  button, and exit the limited edition of the editing software programme.



Was the limited edition of the editing software programme exited when the Toolbox  button was clicked?

### A-1. Concerning BIOS information at startup

The following BIOS information items are displayed on the computer's monitor immediately after the unit's power is turned on. Basic inspections of the PC unit hardware of the unit can be conducted by checking the items displayed.

- (1) Award Modular BIOS version
- (2) Type of CPU
- (3) Main memory size (on completion of memory test)
- (4) System disk drive acquisition status (system disk drive name)
- (5) CD-ROM drive acquisition status (CD-ROM drive name)
- (6) SCSI card (3940 AUWD) SCSI-BIOS startup information
- (7) SCSI-HDD (for 6 units) connection information
- (8) PCI device information

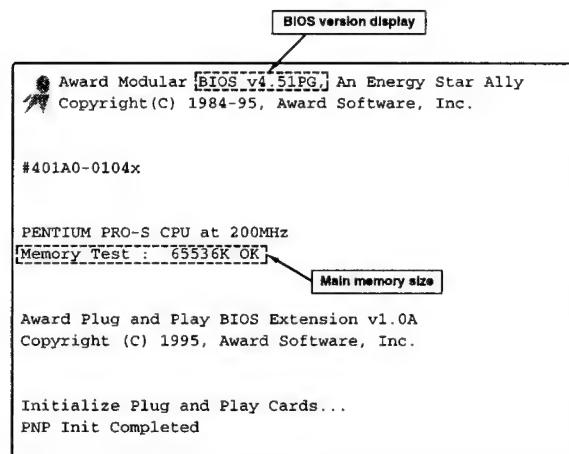
### A-2. Details on PC unit BIOS information checks

The information to be checked on the computer's monitor display immediately after the unit's power is turned on in Section 2-1 (Checking the power startup) of Chapter 2 consists of the following six items. Which part of the screen should be checked is described for each item in turn.

- (1) Main memory size
- (2) CD-ROM drive name
- (3) System disk drive name
- (4) SCSI card name
- (5) SCSI disk drive names (for 6 units)
- (6) Plug & Play (PnP) device list

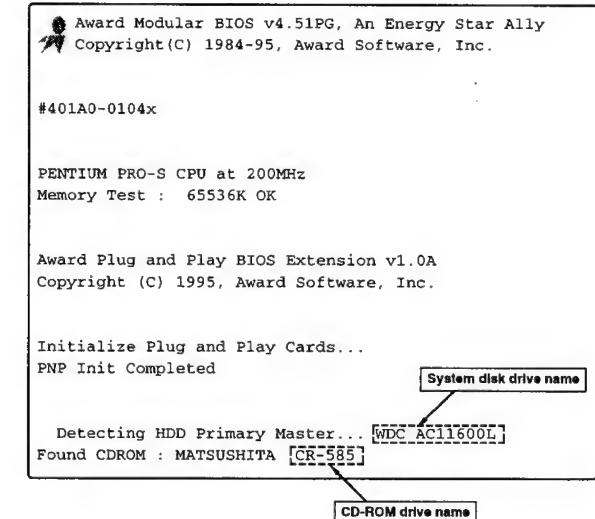
**(1) Main memory size**

The figure below shows the screen which appears after the PC unit's main memory (size: 64 MB) check has been completed with no errors found. "65536 KB (64 MB)" is displayed as the main memory size when the unit is shipped.

**(2) CD-ROM drive name and (3) System disk drive name**

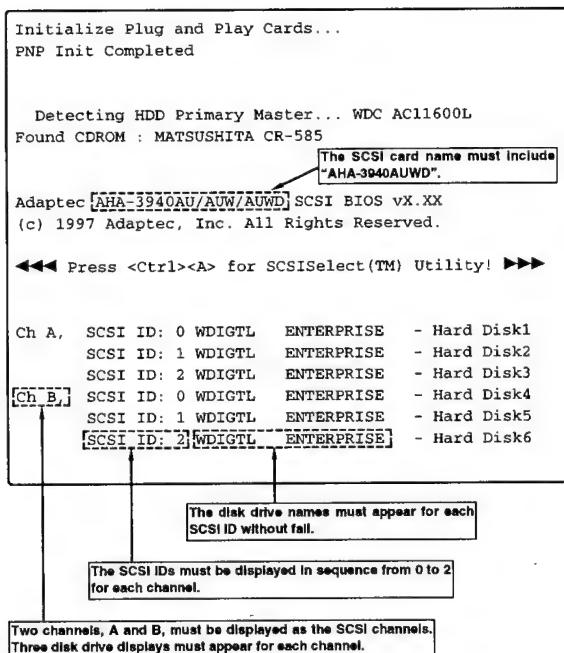
The figure below shows the screen on which the CD-ROM drive and system disk drive are checked and which displays the device information acquired from the devices.

The screen shows that "CR-585" is the unit's CD-ROM drive and that the "WDC AC11600L" made by Western Digital is the unit's system disk drive (HDD).



**(4) SCSI card name and (5) SCSI disk drive names (for 6 units)**

The figure below shows the screen which displays the BIOS installation of the SCSI card (AHA-3940AUWD) inserted into the PCI slot and the information for the six SCSI disk drives connected to the SCSI card.  
Normally, information for all six drives is displayed as shown in the figure.

**(6) PCI device list**

The figure below shows the device list screen which appears after the SCSI device display. The PCI device list occupies the bottom half of the screen. The PCI device list appears only for a short while at the unit's startup stage. Check that the list is displayed and that the Device Class and IRQ sections are displayed.

CPU Clock : 200MHz Cache Memory : 256K

Diskette Drive A	1.44M, 3.5 in.	Display Type	: EGA/VGA
Diskette Drive B	: None	Serial Port(s)	: 3FB 2FB
Pri. Master Disk	: LBA, Mode 4,1624MB	Parallel Port(s)	: 378
Pri. Slave Disk	: CDROM, MODE 3	EDO DRAM at Row	: 01
Sec. Master Disk	: None	BEDO DRAM at Row	: None
Sec. Slave Disk	: None		

<BIOS:> BIOS update data incorrect (CPUID=00000619), Update not loaded.

PCI device listing.....

Bus No.	Device No.	Func No.	Vendor ID	Device ID	Device Class	IRQ
0	1	1	8086	7010	IDE Controller	14/15
0	9	0	102B	0519	Display controller	5
0	11	0	9004	7B95	Mass storage controller	10
0	11	1	9004	7B95	Mass storage controller	9
0	12	0	10FA	0008	Multimedia device	11

It must be checked that Device Class and IRQ are displayed.

## Appendix B SCSI-BIOS Tool

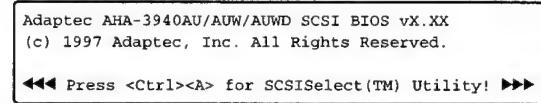
### B-1. Outline of SCSI-BIOS Tool

The SCSI-BIOS Tool makes it possible to:

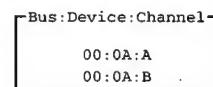
- Check and change the SCSI host adapter settings.
- Check the SCSI device settings which may conflict with other device settings.
- Physically format the SCSI devices.

### B-2. How to start up SCSI-BIOS Tool

1. If Windows NT has been started up, click [Start] → [Shutdown] to restart Windows NT.  
If Windows NT has not been started up, set the power to [ON].
2. When the following message appears on the screen while the PC is starting up, press [Ctrl] + [A] on the keyboard.



3. A dialog box with an underlying blue tone is opened, and the selection screen shown below appears.



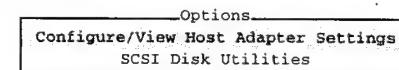
1-31

E - 43

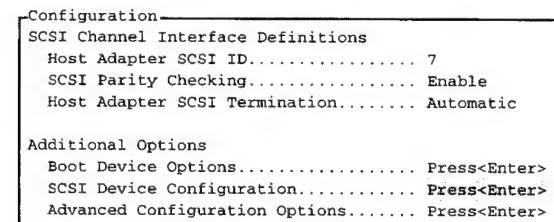
### B-3. How to use SCSI-BIOS Tool

#### (1) Checking the SCSI device configuration

1. Press the [↑] or [↓] arrow key to highlight the SCSI channel to be checked, and then press the [Enter] key to select the channel.  
(Press the [Esc] key to return to the previous menu.)
2. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [Configure/View Host Adapter Settings] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



3. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [SCSI Device Configuration] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



4. The parameters for SCSI devices #0 to #15 now appear. Check that the parameters of all the devices are set as shown below.  
(Press the [Esc] key to return to the previous menu.)

SCSI Device ID	#0	#1	-----	#15
Initiate Sync Negotiation....	yes	yes	-----	yes
Maximum Sync Transfer Rate....	40.0	40.0	-----	40.0
Enable Disconnection.....	yes	yes	-----	yes
Initiate Wide Negotiation....	yes	yes	-----	yes
— Options Listed Below Have NO EFFECT if the BIOS is Disabled —				
Send Start Unit Command.....	no	no	-----	no
BIOS Multiple LUN Support....	no	no	-----	no
Include in BIOS Scan.....	yes	yes	-----	yes

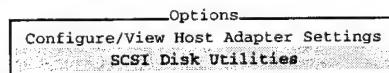
E - 44

### ◇ When the SCSI device parameters are wrong ◇

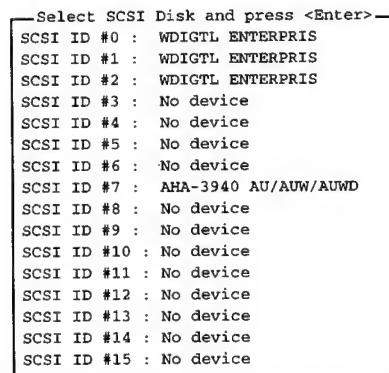
- Change the parameters.  
To change a parameter, press the [↑] or [↓] arrow key to highlight the item to be changed.  
Next, press the [Enter] key. A pop-up menu will appear, and the selectable settings are displayed.  
Highlight the item to be selected, and press the [Enter] key to make the selection.

### (2) Checking the SCSI IDs

1. Press the [↑] or [↓] arrow key to highlight the SCSI channel to be checked, and press the [Enter] key to make the selection.  
(Press the [Esc] key to return to the previous menu.)
2. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [SCSI Disk Utilities] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



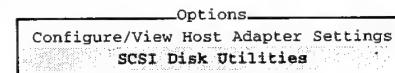
3. Check that the screen shown below now appears.  
(Press the [Esc] key to return to the previous menu.)



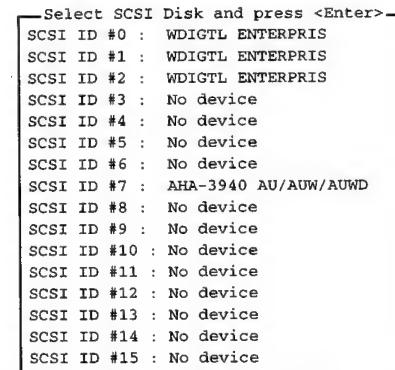
1-32

### (3) Inspecting the disk media

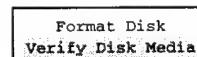
1. Press the [↑] or [↓] arrow key to highlight the SCSI channel to be checked, and press the [Enter] key to make the selection.  
(Press the [Esc] key to return to the previous menu.)
2. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [SCSI Disk Utilities] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



3. The window shown below now appears. Press the [↑] or [↓] arrow key to highlight the SCSI disk (ID #0 to 2) to be inspected, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



4. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [Verify Disk Media] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



5. The [Verify Disk?] message now appears. Select [Yes] to start the disk media check.
6. The progress made is indicated, and when the [Disk Verification Complete] message is displayed, press the [Esc] key.

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◇ If the prompt to re-allocate the disk media appears during the disk media check ◇

- It means that there is a defect in the media.

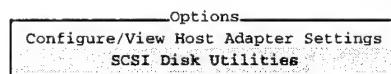
#### (4) Formatting the disk

**Note:**

Basically, this operation need not be performed with this unit. Carelessly and needlessly formatting the disk will destroy the data on the drive.

Once formatting is started, it cannot be aborted.

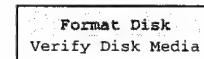
1. Press the [↑] or [↓] arrow key to highlight the SCSI channel to be checked, and press the [Enter] key to make the selection.  
(Press the [Esc] key to return to the previous menu.)
2. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [SCSI Disk Utilities] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



3. The window shown below now appears. Press the [↑] or [↓] arrow key to highlight the SCSI device to be inspected, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)

```
Select SCSI Disk and press <Enter>
SCSI ID #0 : WDIGTL ENTERPRIS
SCSI ID #1 : WDIGTL ENTERPRIS
SCSI ID #2 : WDIGTL ENTERPRIS
SCSI ID #3 : No device
SCSI ID #4 : No device
SCSI ID #5 : No device
SCSI ID #6 : No device
SCSI ID #7 : AHA-3940 AU/AUW/AUWD
SCSI ID #8 : No device
SCSI ID #9 : No device
SCSI ID #10 : No device
SCSI ID #11 : No device
SCSI ID #12 : No device
SCSI ID #13 : No device
SCSI ID #14 : No device
SCSI ID #15 : No device
```

4. The selection screen shown below now appears. Press the [↑] or [↓] arrow key to highlight the [Format Disk] item, and press the [Enter] key.  
(Press the [Esc] key to return to the previous menu.)



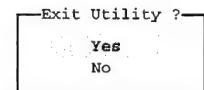
5. The [Format Disk?] prompt now appears. If [Yes] is selected, the [Are you sure?] prompt appears.  
If [Yes] is selected, the message shown below appears, and formatting is commenced.

```
!!! Please Wait !!! !!! Please Wait !!!
Depending on your disk capacity, formatting
may take from one minute to several hours
!!! Please Wait !!! !!! Please Wait !!!
```

6. Upon completion of the formatting, the [Formatting Complete] message appears. Press the [Esc] key.

#### B-4. How to exit SCSI-BIOS Tool

1. Press the [Esc] key several times until the following message box appears on the screen.



2. Select [Yes] and press the [Enter] key twice.

## Appendix C *HDD inspection methods using Disk Administrator provided with Windows NT*

### C-1. Outline of Disk Administrator

The Disk Administrator is a graphic tool for administrate the disk resources.

#### Outline of operations which the Disk Administrator can perform

- Volumes can be formatted and labeled.
- The usable free space for creating partition sizes and additional partitions and other disk-related status information can be read.
- The allocation of the drive names, volume labels, file system types and sizes and other Windows NT volume-related status information can be read.

### C-2. How to start up Disk Administrator

1. From the [Start] menu, select and click [Programs] → [Administrative Tools] → [Disk Administrator].

<Respond to messages until Disk Administrator starts up>

2. "System configuration will be automatically updated to reflect these changes when you next opt to save changes when exiting Disk Administrator."  
: [OK]

3. "System configuration will now be updated." : [OK]

4. "Do you want to write a signature on Disk XX so that Disk Administrator can access the drive?"  
: [Yes]

5. The Disk Administrator now starts up, and the dialog box shown in Fig. 1 appears on the screen.

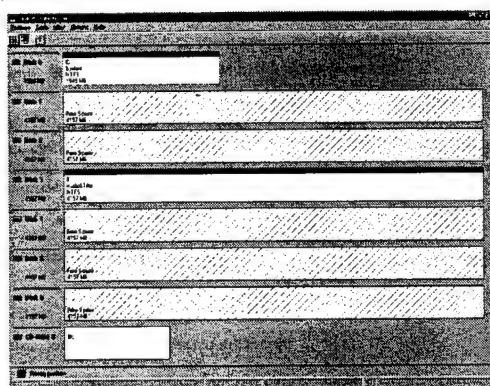


Fig. 1 Disk Administrator dialog box

### C-3. Checking the disk settings

#### Checking the Windows NT volume-related status information

On the Disk Administrator dialog box, check that the disk statuses are as shown below.

Disk No.	Drive name	Format
Disk 0	C :	NTFS
Disk 1	Free Space	_____
Disk 2	Free Space	_____
Disk 3	E :	NTFS
Disk 4	Free Space	_____
Disk 5	Free Space	_____
Disk 6	Free Space	_____
CD-ROM	D :	_____

#### ◇ When the number of disks is insufficient or what is displayed differs from what is shown in the above table ◇

- Following the instructions in C-6 (page E-55), exit the Disk Administrator and Windows NT, and try rebooting the unit.  
Perform the checks in C-2 and C-3 again when the unit is started up again.
- If the status still remains unchanged, an incorrect disk setting or defective disk may be to blame.

#### C-4. How to inspect the disks

1. Click the disk to be checked.
2. Click [Properties] from the [Tools] menu. The dialog box in Fig. 2 is now opened.

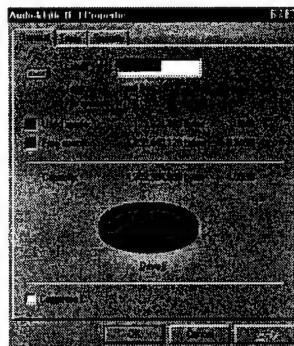


Fig. 2 Properties dialog box

3. When the [Tools] tag is clicked, the dialog box shown in Fig. 3 is opened.

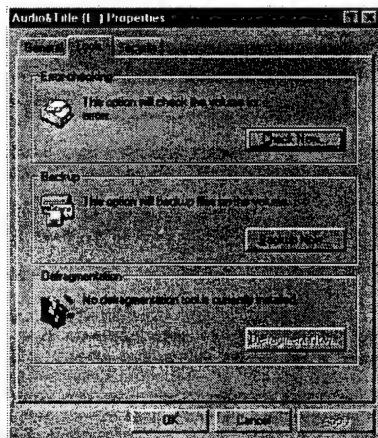


Fig. 3 Properties tool dialog box

4. When [Check Now...] is clicked in the Error-checking, the HDD check option dialog box shown in Fig. 4 is opened. When a check has been entered for the check disk option, click it to release (cancel) the check. When the check status is displayed after checking "Start" button and the check is completed, the dialog box signaling completion shown in Fig. 5 appears. Click [OK].

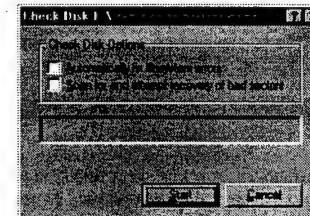


Fig. 4 HDD check option dialog box



Fig. 5 Dialog box signaling completion

5. The properties tool dialog box screen shown in Fig. 3 now returns. Click [Cancel] to exit the tool.

◇ When a check is conducted on disk 0 and the check is completed with one or more errors found ◇

- There is a possibility that the system disk is destroyed.

◇ When a check is conducted on disk 3 and the check is completed with one or more errors found ◇

- There is a possibility that the AV disk is destroyed.

## C-5. How to format disks

The steps outlined in this section are taken only for disk number 3 (drive E:) when a major problem has occurred in the editing software programme installed in the unit and the unit's disk configuration information has been lost. **Carelessly and needlessly formatting the disk will destroy not only the installed editing software programme but the unit's system software programmes and recorded data as well and is, therefore, not recommended.**

### Formatting method

1. Click the disk which needs to be formatted while the Disk Administrator dialog box shown in Fig. 1 is on the screen.
2. When [Create] is clicked on the [Partition] menu, the partition creation dialog box shown in Fig. 6 appears. Click [OK].

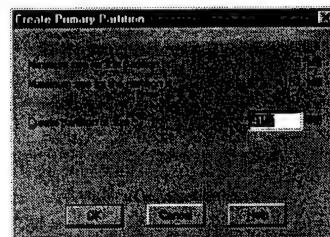


Fig. 6 Partition creation dialog box

3. When [Commit changes Now] is clicked on the [Partition] menu, the confirmation dialog box shown in Fig. 7 appears. Click [Yes].



Fig. 7 Confirmation dialog box

4. The error-free termination dialog box shown in Fig. 8 appears. Click [OK].



Fig. 8 Error-free termination dialog box

5. When [Format] is clicked on [Tool] menu, the format dialog box shown in Fig. 9 appears. Set [NTFS] as the file system item and [Quick format] as the format option item, and click [Start].

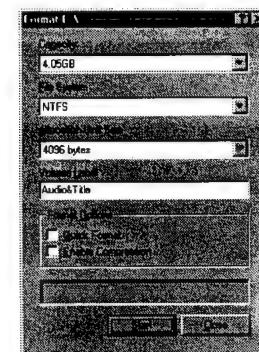


Fig. 9 Format dialog box

6. The user is now prompted to confirm whether formatting is to commence by the dialog box shown in Fig. 10. Click [OK].



Fig. 10 Confirmation dialog box

7. The user is notified that formatting is completed by the dialog box shown in Fig. 11. Click [OK].



Fig. 11 Confirmation dialog box

### C-6. How to exit Disk Administrator

- Select and click [EXIT] on the [Partition] menu.

### D-1. Outline of Event Viewer

The Event Viewer is a tool which makes it possible to monitor the recording (in the system log) of the events issued by the Windows NT system or applications.

The information obtained from the Event Viewer can be used to analyze the past trouble which has occurred in the unit's system.

### D-2. How to start Event Viewer

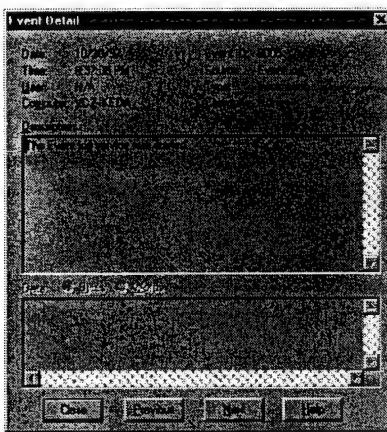
1. Exit all applications, and return to the Windows NT startup screen.
2. Select and click [Programs] → [Administrative tools] → [Event Viewer] from the [Start] menu.
3. [System Log] is now displayed. (One example is shown in the figure below.)

Time	Event ID	Source	Type	User	Computer	Category	Keywords
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 8:37:05 PM	8005	N/A	Information			V02-KEDA	
① 1/21/97 3:36:23 PM	3012	N/A	Information			V02-KEDA	
① 1/21/97 3:24:36 PM	6005	N/A	Information			V02-KEDA	
① 1/21/97 3:25:36 PM	1003	N/A	Information			V02-KEDA	
① 1/21/97 3:25:36 PM	6005	N/A	Information			V02-KEDA	
① 1/20/97 9:08:42 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 9:08:41 PM	8033	N/A	Information			V02-KEDA	
① 1/20/97 8:37:05 PM	6005	N/A	Information			V02-KEDA	
① 1/21/97 3:36:23 PM	3012	N/A	Information			V02-KEDA	
① 1/21/97 3:24:36 PM	6005	N/A	Information			V02-KEDA	
① 1/21/97 3:25:36 PM	1003	N/A	Information			V02-KEDA	

## Appendix E Shutdown Procedure at Hang-up for Limited Edition of the Editing Software Programme

### D-3. Checking system events

1. Click one of the events recorded in the [System Log] to set it to the "selected colouring" status, and double-click it.
2. [Event Detail] now appears. (One example is shown in the figure below.)



1-38

### D-4. How to exit Event Viewer

1. Click the [Close] button to exit [Event Detail].
2. Click  at the top right to exit the [System Log].

If, when checking operation using the limited edition of the editing software programme, an unspecified operation causes input to no longer be accepted, try using the procedure below to shut down the programme.

1. From the keyboard, press [Ctrl] + [Alt] + [Delete] (all three keys) at the same time.
2. The "Windows NT Security" window is displayed. Click the [Task Manager] button as instructed by the "Use the Task Manager to close ..." message.
3. The "Windows NT Task Manager" window is displayed. From among the items shown in the list, click on "Toolbox32" so that it is highlighted to indicate that it is selected. Then click the [End Task] button.
4. When a dialog box with the indication "This Windows application cannot ..." appears, click the [End Task] button. (If the dialog box does not appear, click the [End Task] button a second time.)  
(If the task ends without the dialog box being displayed, continue with the next step.)
5. The "Windows NT Task Manager" window reappears. Repeat steps 3 and 4 above to end the remaining tasks listed.
6. Click on the  mark in the upper right corner of the "Windows NT Task Manager" window to close the Task Manager.

---

# **SECTION 2**

---

# **DETAILED**

# **DISASSEMBLY METHOD**

---

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## 2. DETAILED DISASSEMBLY METHOD

### 2-1. Removal of the Mechanism Unit

- 1) Loosen the lock screw (A) on the Front Panel, and pull the Mechanism Unit to front.

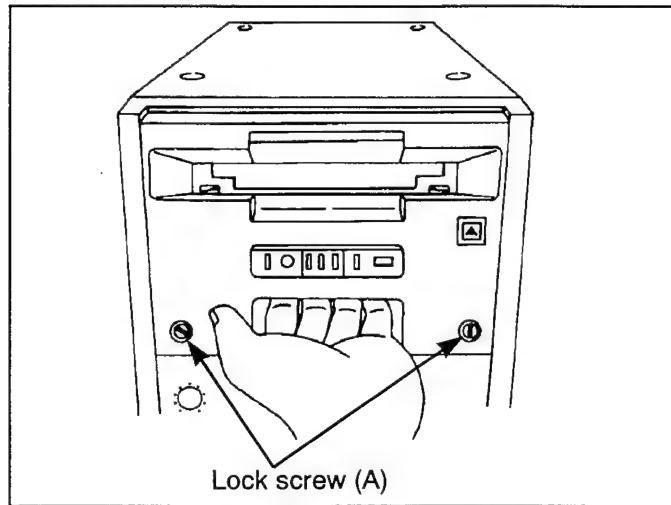


Fig. D1

- 2) Unscrew the 4 screws (B) (each 2 screws on both sides), and remove the connector P32.

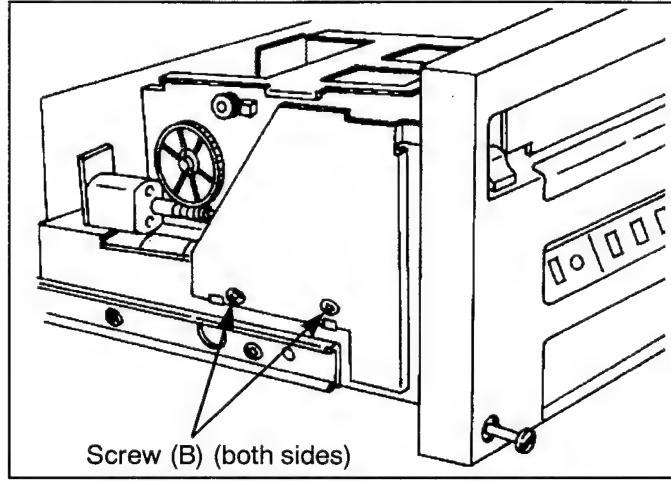


Fig. D2

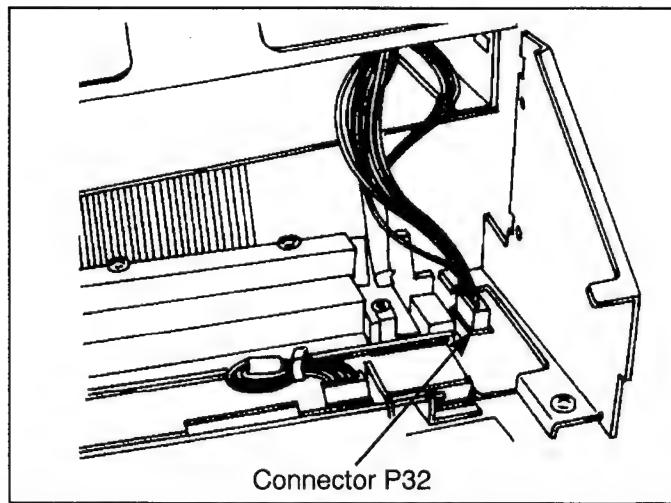


Fig. D3

- 3) Unscrew the 2 screws (C) on the bottom of the Mechanism Unit. Loosen 2 screws (D) and remove the Bottom Cover.

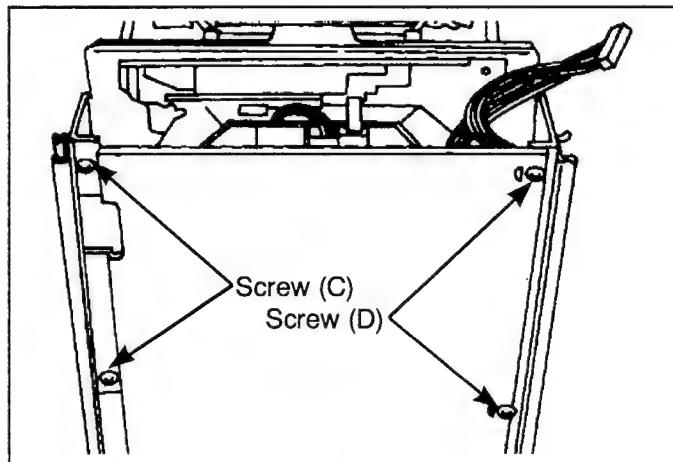


Fig. D4

- 4) Disconnect the 2 connectors P1 and P2 on the MECHA I/F C.B.A..

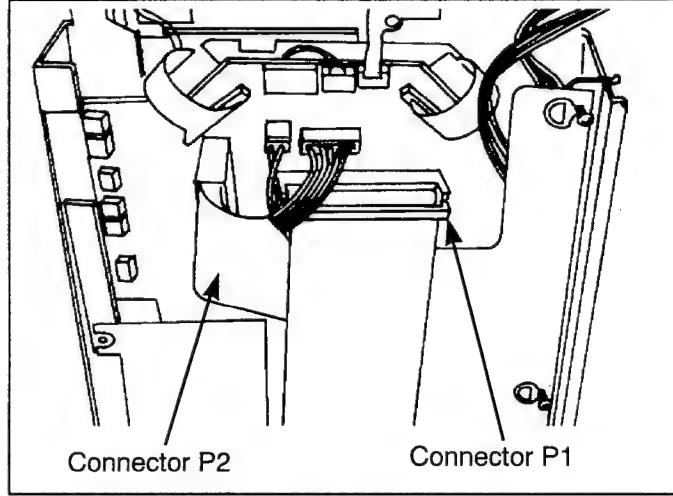


Fig. D5

- 5) Disconnect the 2 flexible cable connector P3 and P4 on the HEAD BUFF 1 C.B.A..

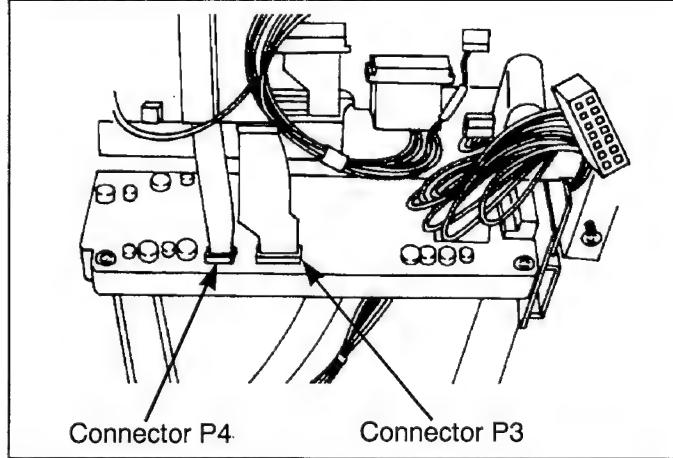


Fig. D6

6) Disconnect the connector P2 on the A/C HEAD I/F C.B.A..  
 (This C.B.A. is on the left side of the Mechanism Unit.)

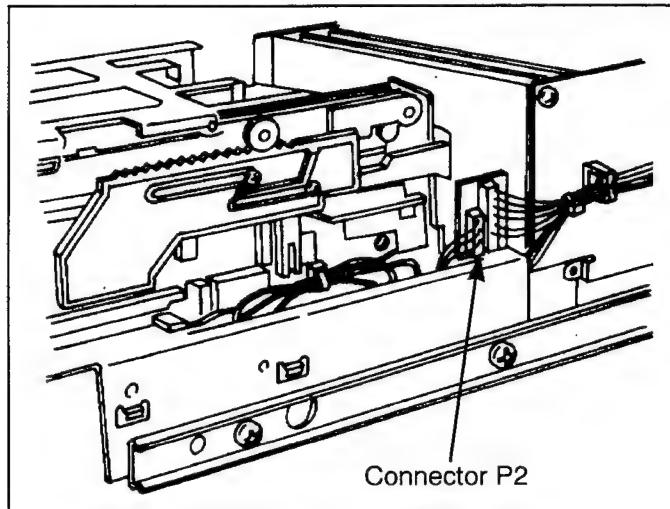


Fig. D7

7) Turn the Emergency Eject Gear on the right side of the Mechanism Unit by the screw driver. Move the Front Loading Position that you can see the 2 screws (E). Unscrew the 3 screws (E), and lift up the Mechanism Unit slowly.

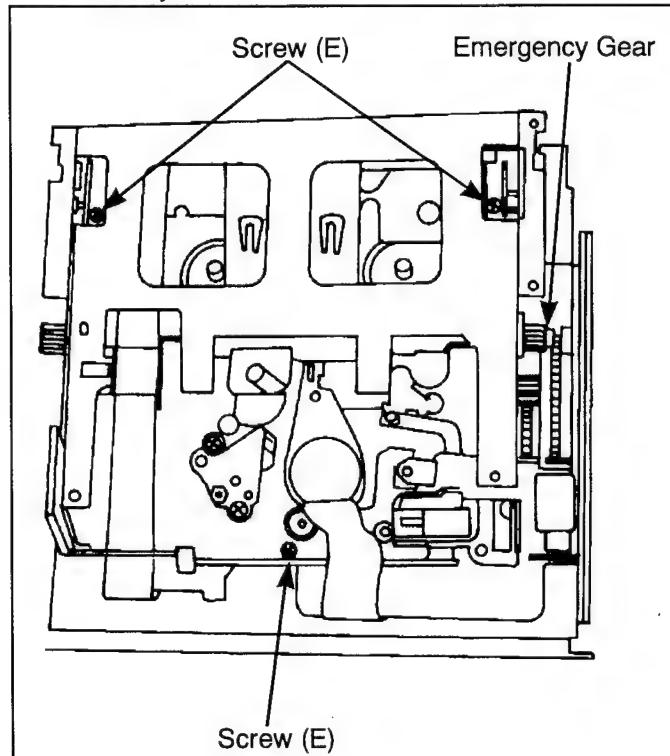


Fig. D8

## 2-2. Removal of the Side Panels (same method both sides)

1) Unscrew the 6 screws (F) and remove the Side Panel. (Fig. D9 shows the right side panel.)

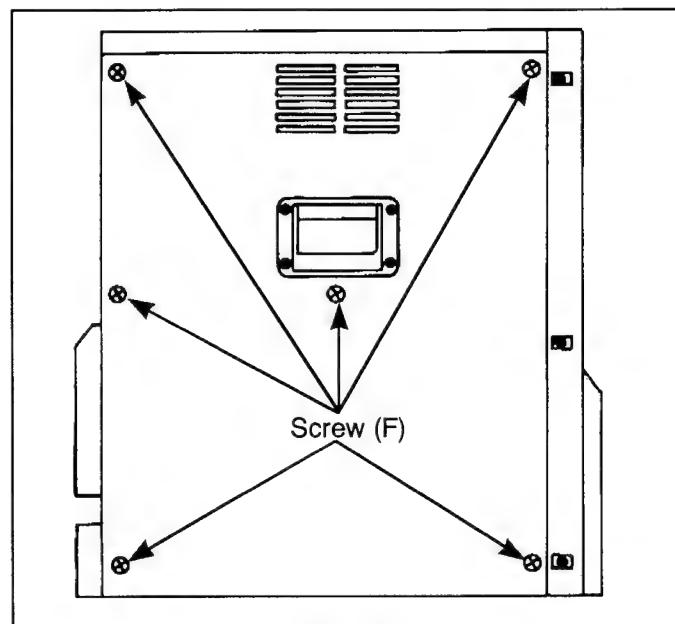


Fig. D9

## 2-3. Removal of the C.B.A.s (VTR section)

1) First remove the right side panel.  
 2) Unscrew the 4 screws (G) on the Handle Panel of the right side, and remove it.

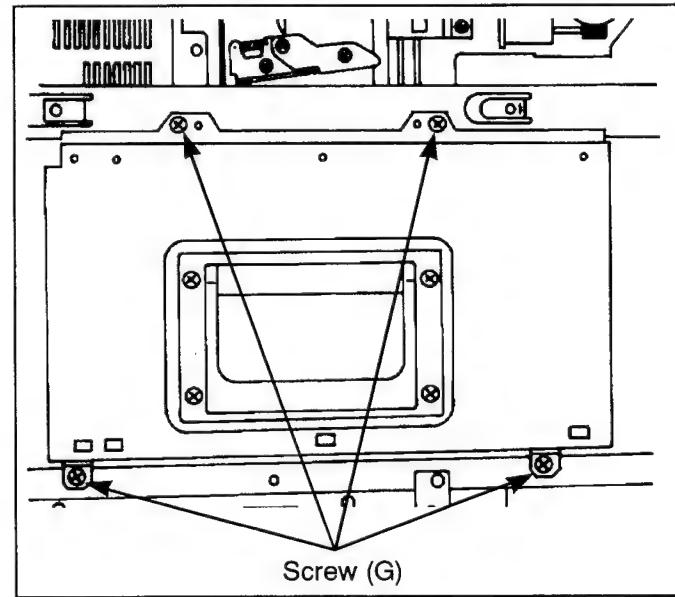


Fig. D10

3) Slowly pull out toward you the necessary C.B.A..

## 2-4. Removal of the Power Supply Unit (VTR section)

- 1) First remove the both of side panels.
- 2) Unscrew the screw (H) and 6 screws (J), and remove the Rear Jack Panel. After that Rear Jack Panel catch on the frame.

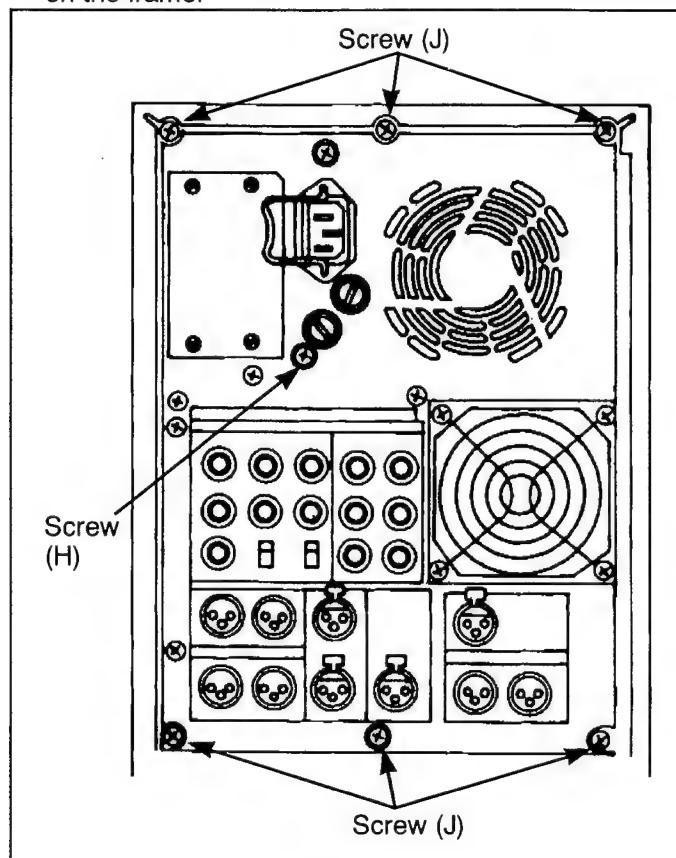


Fig. D11

- 3) Disconnect the connector (K) and unscrew the 2 screws (L).

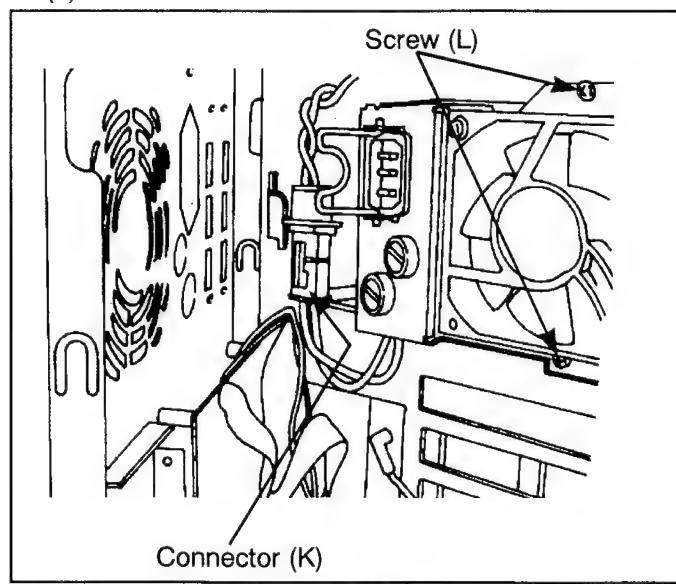


Fig. D12

- 4) Remove a screw (M) on the right side of the unit.

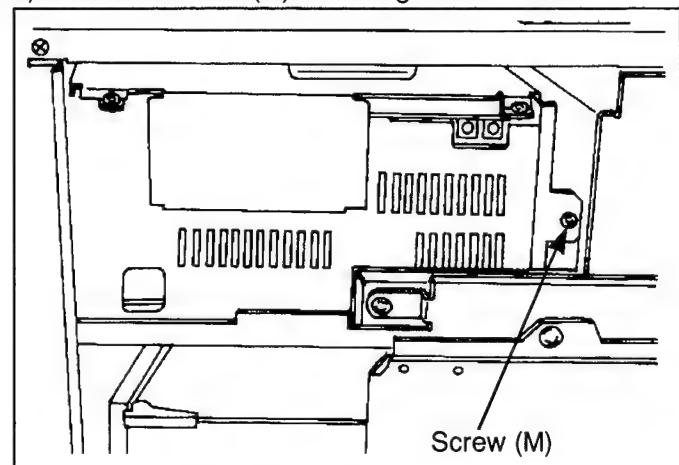


Fig. D13

- 5) Disconnect the 5 connectors (P1011, P1012, P1013, P1102, P1103) on the left side of the unit. Slowly pull out the Power Unit from the rear side of the unit.

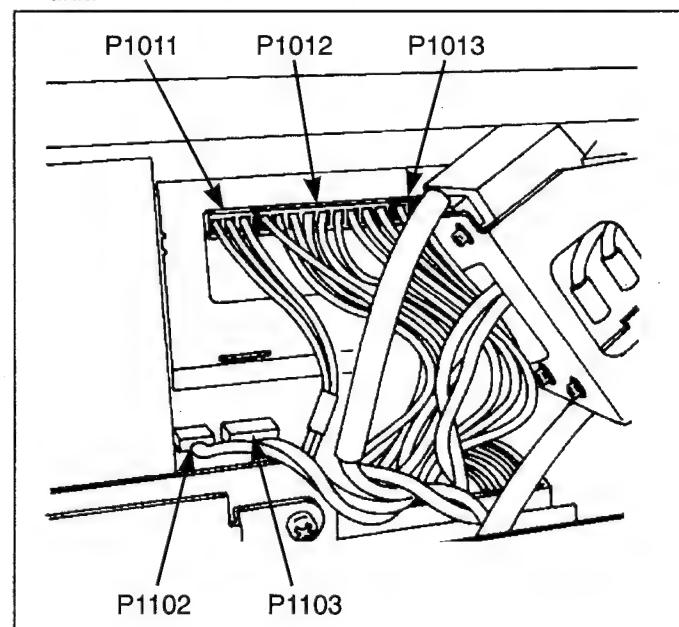


Fig. D14

**When you carry out the item 2-5 and 2-6, please observe as shown below**

### Handling Precaution for Hard Disk

- Be careful with handling in the circumstance for static electricity.
- Be careful with don't give shock and vibration to Hard Disk.
- Be careful with don't short the circuit.

### 2-5. Exchange of the AV Hard Disk

- 1) First remove the right side panel.
- 2) Disconnect the SCSI connector and Power connector of the Hard Disk which you want to exchange.
- 3) Unscrew the 4 screws (N) (each 2 screws on both sides) on the Hard Disk Hold Angle, and remove it.
- 4) Slowly pull out the Hard Disk.

(\* When you exchange the Hard Disk, please use the mounting bracket which was just removed Hard Disk's.)

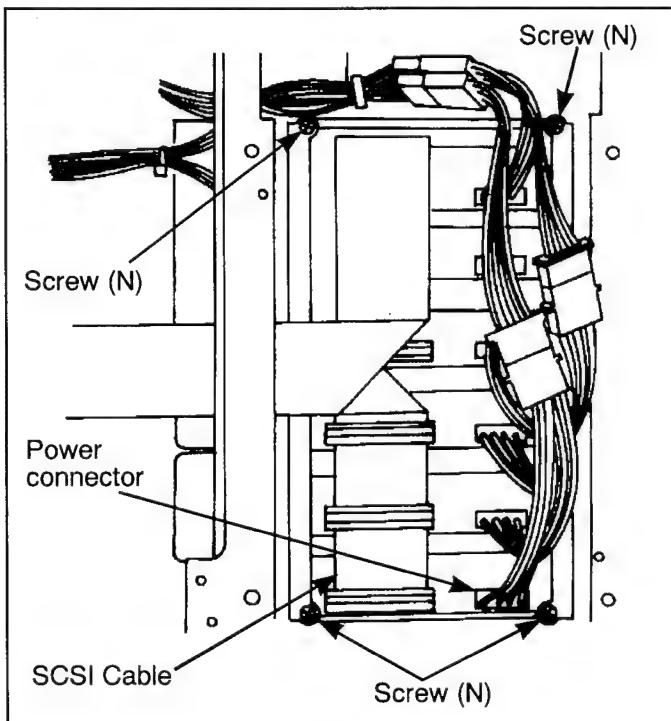


Fig. D15

### Caution for Installation

ID setting jumper pins were installed on the front of the Disk as shown below. When you install the new Hard Disk, reinstall the ID setting jumper pins as specified from old Hard Disk to new one.

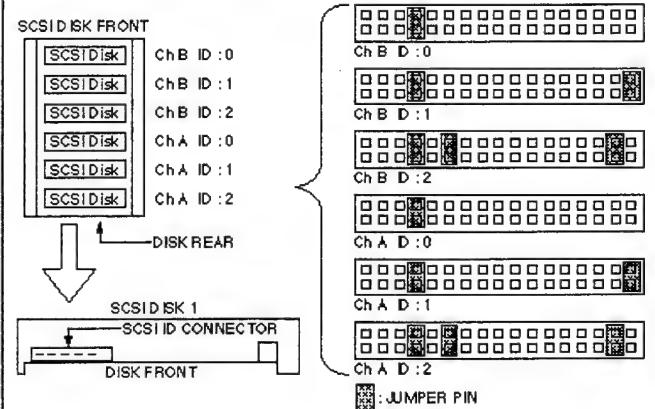


Fig. D16

### 2-6. Exchange of the SYS Hard Disk

- 1) First remove the right side panel.
- 2) Unscrew the 2 screws (O).
- 3) Lift up the SYS Hard Disk a little, and pull out toward you slowly.

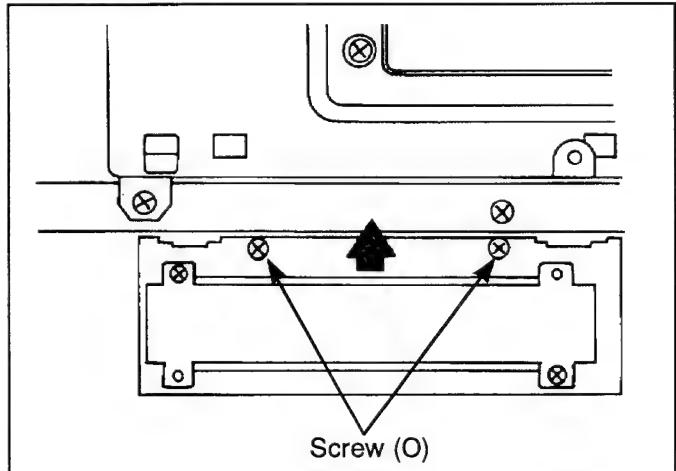


Fig. D17

4) Disconnect the EIDE cable connector and the Power connector on the rear side of the Hard Disk, and take the Hard Disk out of the unit.

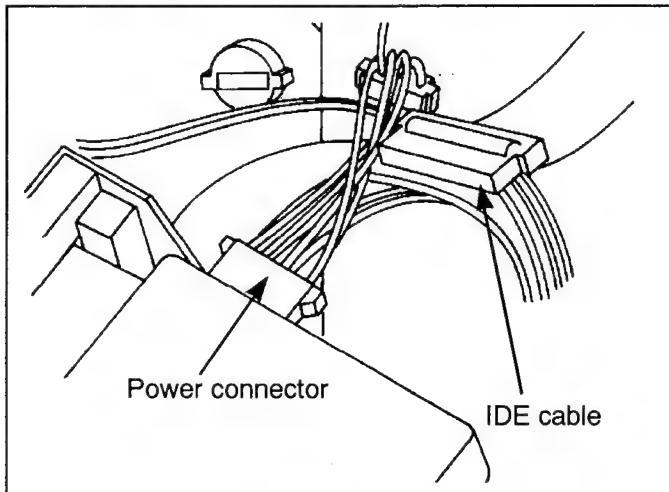


Fig. D18

5) Unscrew the 2 screws (P) on the Hard Disk hold angle, and remove the Hard Disk hold angle.

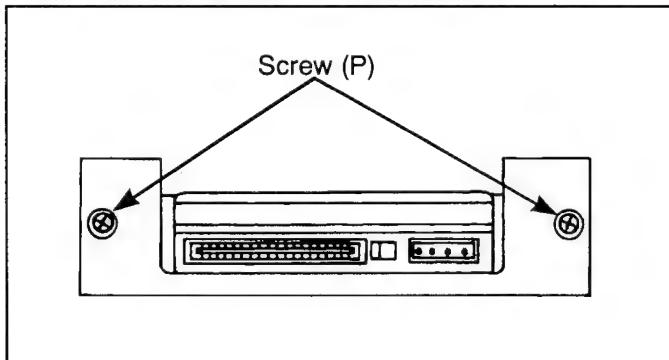


Fig. D19

6) Pull out the Hard Disk slowly, and remove it.  
 (\* When you exchange the Hard Disk, please use the mounting bracket which was just removed Hard Disk's.)  
 7) When you installing, insert the pin on the Hard Disk frame to the hole on the unit frame.

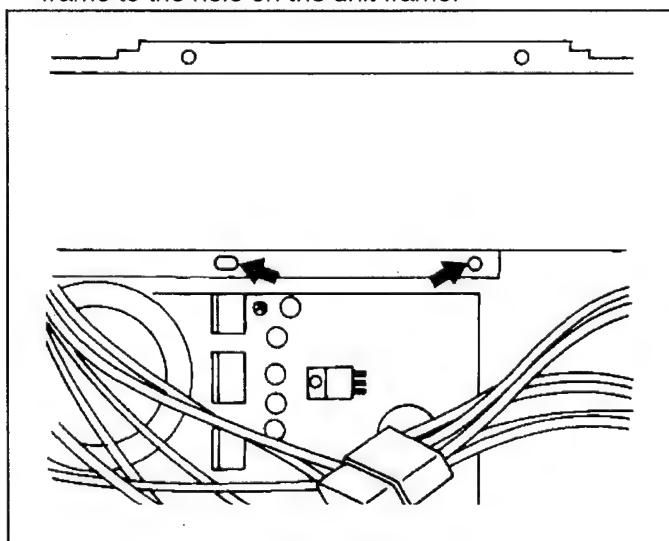


Fig. D20

### Caution for Installation

Master setting jumper pins were installed on front of the Disk as shown below. When install the new Hard Disk, reinstall the master setting jumper pins as specify from old Hard Disk to new one.

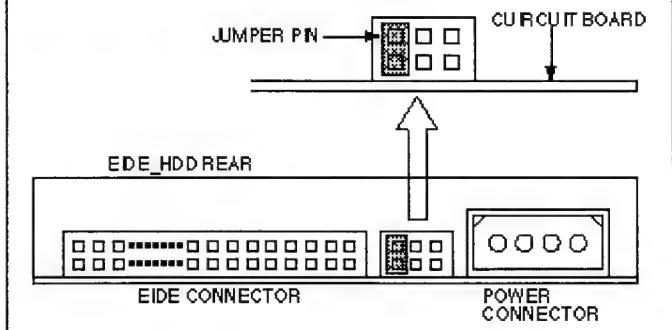


Fig. D21

### 2-7. Exchange of the CD-ROM Drive

1) Unscrew the 2 screws (Q), and pull out the CD-ROM Drive slowly.

Disconnect the EIDE connector and Power connector on rear of the CD-ROM Drive, and remove the CD-ROM Drive.

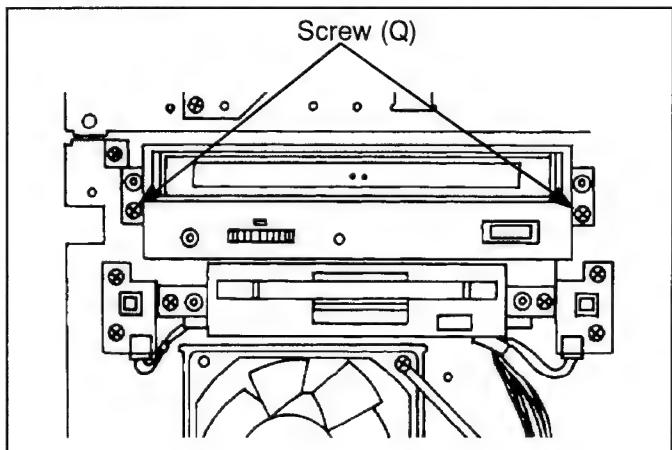


Fig. D22

### Caution for Installation

Slave setting jumper pins were installed on front of the Disk as shown below. When install the new CD-ROM Drive, reinstall the slave setting jumper pins as specify from old CD-ROM Drive to new one.

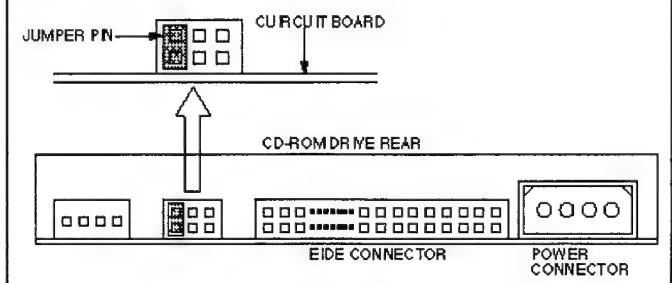


Fig. D23

## 2-8. Exchange of the FD Drive

- 1) Unscrew the 2 screws (R), and pull out the FD Drive slowly.  
Disconnect the EIDE connector and Power connector on rear of the FD Drive, and remove the FD Drive.

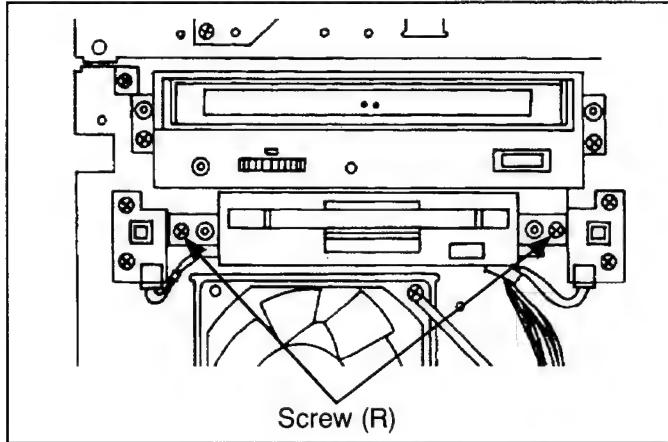


Fig. D24

- 3) Unscrew the screw (T) on the card you want, and pull out the card slowly.

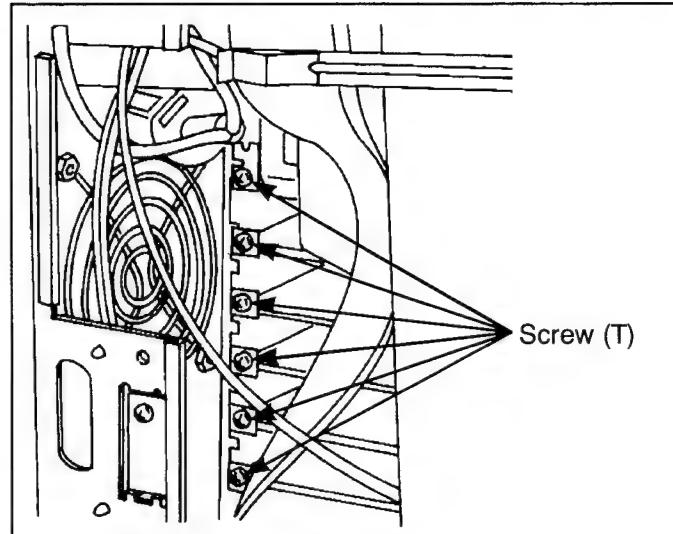


Fig. D27

## 2-9. Exchange of the SCSI, VGA, X4 PCI, and Remote I/O Cards

- 1) First remove the right side panel.
- 2) Loosen the 3 screws (S) on the card hold angle, and shift forward a little. Disconnect the connector P1 on the X4 PCI card and connector J5 on the Remote I/O card, then remove the hold angle.

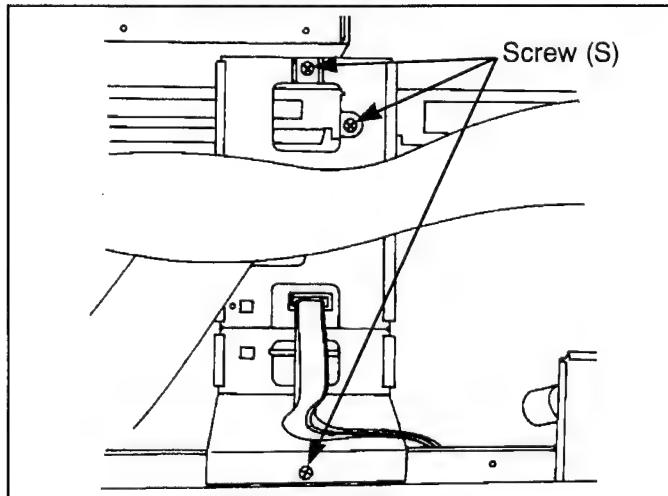


Fig. D25

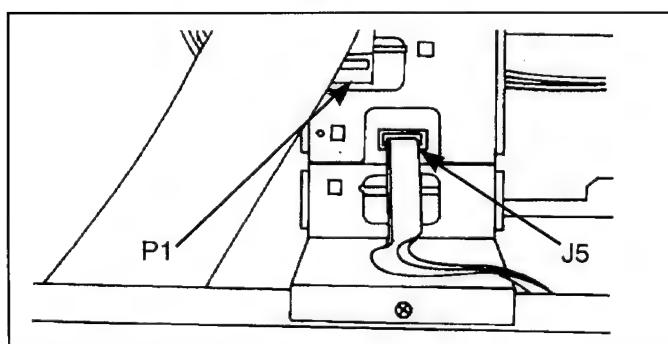


Fig. D26

## 2-10. Exchange of the Power Supply Unit (PC section)

- 1) First remove the right side panel.
- 2) Unscrew the 4screw (U) on the Power Fan Cover of rear side of the unit.  
Remove the Fan Cover, and pull out the AC Plug.

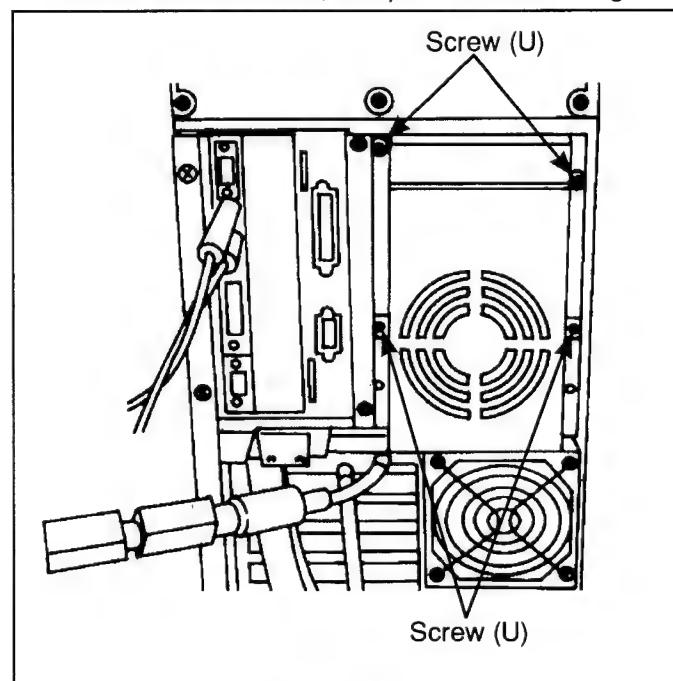


Fig. D28

- 3) Disconnect the Power connectors P1, P3, P4, P5, P6, P7 and P8 inside of the unit.
- 4) Pull out the Power Supply Unit direction of rear side of the unit. Disconnect the connector (V) on the CPU Board, and remove the Power Supply Unit.

Confirm the connection between each power connectors and destinations as shown below.

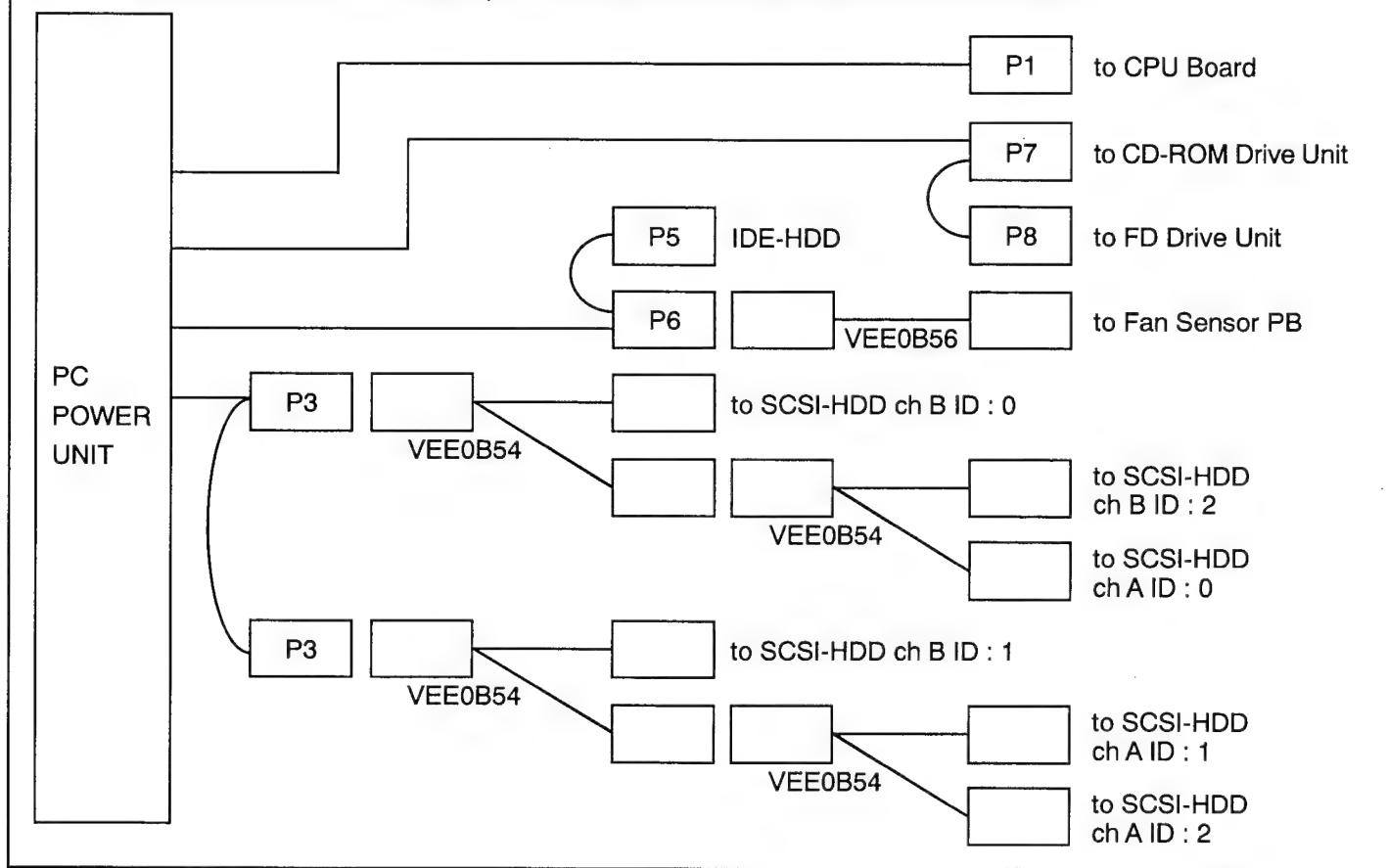


Fig. D29

**MEMO :**

## SECTION 3

# MAINTENANCE & MECHANICAL ADJUSTMENT

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# 1. Maintenance

## 1-1. Maintenance Parts Chart

	Name	Part Number	Part Using Hours (unit hours)					
			2,000	4,000	6,000	8,000	10,000	12,000
1	Tape Path Cleaning	—	△	Clean the Tape Path at each 500 hours.				
2	Cylinder Unit	VEG1443	●	●	●	●	●	
3	Pinch Arm Unit	VXL2835	●▲	●▲	●▲	●▲	●▲	
4	Cleaning Arm Unit	VXL2748	●	●	●	●	●	
5	S Reel Motor Unit	VEM0635		●		●		
6	T Reel Motor Unit	VEM0636		●		●		
7	Thrust Screw Unit	VXQ0556		●		●		
8	S Loading Arm Unit	VXL2812			●			
9	T1 Board Unit	VXA6088			●			
10	S Post Base Unit	VXA6025			●			
11	Tension Arm Unit	VXL2832			●			
12	Mech. Chassis Unit	VXY1300Z1						●

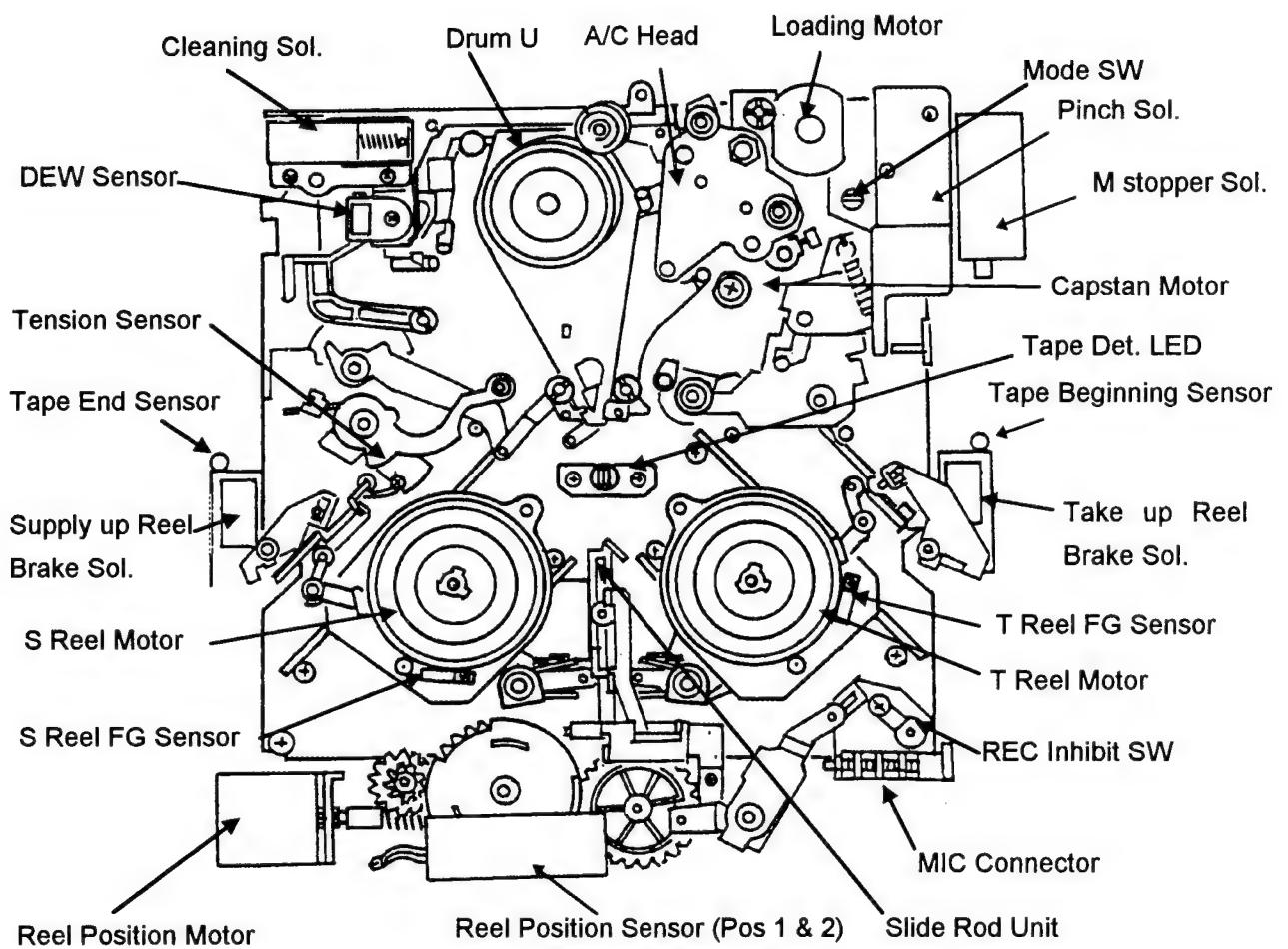
**Note:** Using hours are based on the head rotation hours.

Using hours are recommendation. It may depend on temperature, humidity or dusty.

Using hours are listed as the reference of maintenance. They do not mean guarantee Hours.

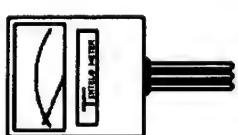
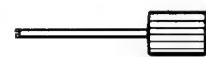
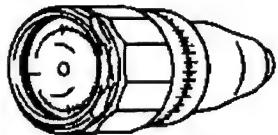
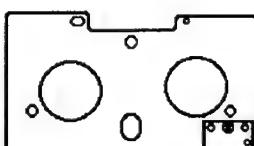
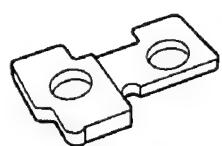
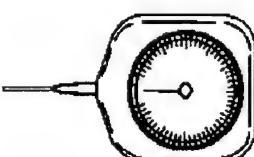
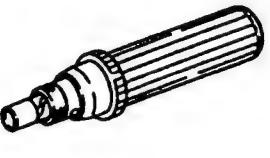
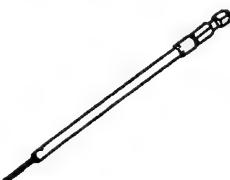
Symbol	Maintenance	Remark
●	Replacement	
■	Greasing	Wipe the old grease and apply new grease
△	Cleaning	This mark means cleaning is necessary.
▲	Lubrication	The lubrication is necessary

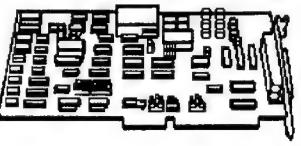
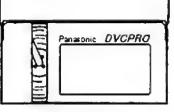
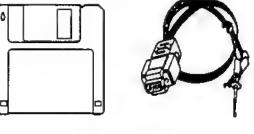
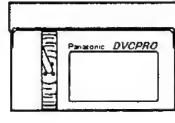
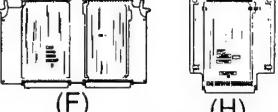
## 1-2. Sensors Layout



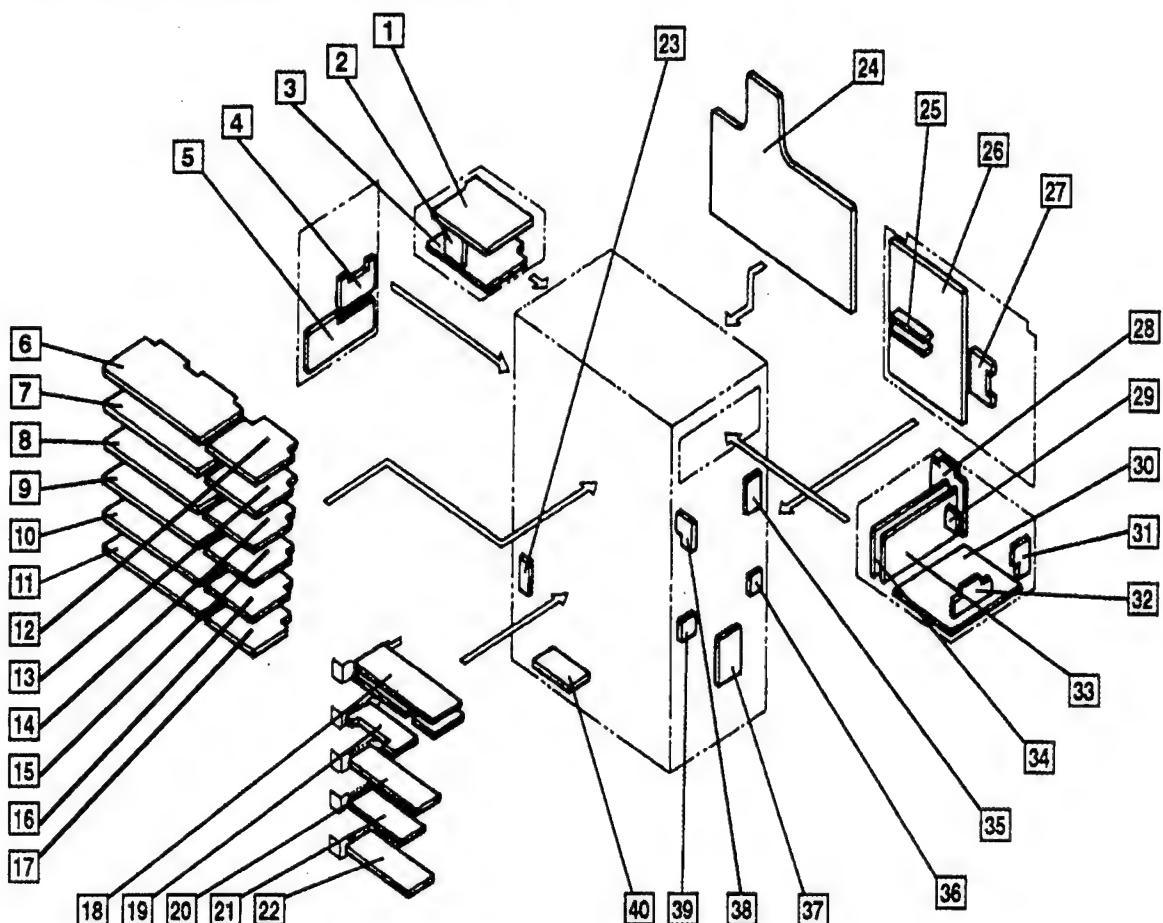
### 1-3. Servicing Fixtures & Tools

No.	Part No.	Part Name	AJ-D750	Remarks
1	VFK1145	Back Tension Meter	○	Model : T2-M30-P
2	VFK1149	Post Driver	○	
3	VFK71	Dial Torque Gauge (150g)	○	
4	VFK1191	Dial Torque Gauge (45g)	○	
5	VFK1152	Dial Torque Gauge Adapter	○	
6	VFK0357	Eccentric Screwdriver (φ 1.5)	○	
7	VFK1154	Post Height Fixture	○	
8	VFK1153	Mech Neutral Plate (Post)	○	
9	VFK1157	Mech Neutral Plate (cassette)	○	
10	VFK1155	REV, Gold	○	
11	VFK1156	PLAY, Black	○	
12	VFK1208	Neutral, Black with hole	○	
13	VFK1150	Nut Driver (5.5mm)	○	
14	VFK1151	Nut Driver (2.5mm)	○	
15	VFK1188	Dial Tension Gauge (30g)	○	
16	VFK0948	Check Light	○	
17	VFK0749	Froiral Grease (White)	○	for plastic part
18	MOR265	Morlytone Grease (Black)	○	for metal part
19	VFK1146	Philips Driver (00 x 75)	○	
20	VFK1147	Philips Driver (0 x 100)	○	
21	VFK1148	Hex. Driver (1.5mm)	○	
22	VFK1178	Hex. Driver (0.89mm)	○	
23	VFK1179	Hex. Driver (0.71mm)	○	
24	VFK1190	Hex. Wrench (1.5mm)	○	
25	VFK1209	Torque Driver (0.4 - 3kg)	○	
26	VFK0912	Post Axis Driver (1.5mm)	○	
27	VFK1300	A/D Converter Board	○	For Quatech. DAQ-12 Purchase Locally
28	VFM3680KM	DVC PRO Alignment Tape (PAL)	○	or VFM3680KL
29	VFM3681KM	DVC PRO Alignment Tape (PAL)	○	or VFM3681KL
30	VFM3682KM	DVC PRO Alignment Tape (PAL)	○	or VFM3682KL
31	AJ-CL12MP	Cleaning Tape	○	
32	VFK1420	LISTA Software	×	New
33	VFK1186	LISTA Cable	○	
34	VFK1369	Tape Sensor Alignment Cassette	○	
35	VFK1192	Extension Board (F)	○	Common for AJ-D750
36	VFK1193	Extension Board (H)	○	Common for AJ-D750

1 VFK1145 Back Tension Meter   Model:T2-M30-P	2 VFK1149 Post Driver  	3 VFK71 (150g) 4 VFK1191(45g) Dial Torque Gauge  	5 VFK1152 Dial Torque Gauge Adapter  
6 VFK0357( $\phi$ 1.5) Eccentric Screwdriver  	7 VFK1154 Post Height Fixture  	8 VFK1153 Mech Neutral Plate(Post)  	9 VFK1157 Mech Neutral Plate (cassette)  
10 VFK1155 (REV, Gold) 11 VFK1156 (PLAY, Black) 12 VFK1208(Neutral,Black With hole)    (Gold) (Black)	13 VFK1150 Nut Driver(5.5mm)   5.5mm	14 VFK1151 Nut Driver(2.5mm)   2.5mm	15 VFK1188(30g) Dial Tension Gauge  
16 VFK0948(or purchase locally) Check Light  	17 VFK0749 Froiral Grease(White) (for plastic part)  	18 MOR265 Morlytone Grease(Black) (for metal part)  	19 VFK1146 (00 x 75) 20 VFK1147 (0 x 100) Philips Driver  
21 VFK1148(1.5mm) 22 VFK1178(0.89mm) 23 VFK1179(0.71mm) Hex. Driver  	24 VFK1190 (1.5mm) Hex. Wrench  	25 VFK1209 Torque Driver(0.4-3Kg)  	26 VFK0912 Post Axis Driver(1.5mm)  

27	VFK1300 A/D Converter Board (For Quatech. DAQ-12 Purchase Locally)  	28	VFM3680KM 29 VFM3681KM 30 VFM3682KM 31 DVC PRO Alignment Tape (PAL)  	31	AJ-CL12MP Cleaning Tape  	32	VFK1420 LISTA Software 33 VFK1186 LISTA Cable  
34	VFK1369 Tape Sensor Alignment Cassette  	35	VFK1192 ---(F) 36 VFK1193 ---(H) Extension Board   (F) (H) Common for AJ-D750				

## 1-4. CIRCUIT BOARD LOCATION



Circuit Board Name Table

No.	Circuit Board Name	No.	Circuit Board Name
1	POWER 2 P.C.BOARD	21	SVGA P.C.BOARD
2	POWER CONNECTION P.C.BOARD	22	REMOTE I/O P.C.BOARD
3	POWER 1 P.C.BOARD	23	PC R FAN INTERFACE P.C.BOARD
4	VIDEO REAR P.C.BOARD	24	VTR MOTHER P.C.BOARD
5	AUDIO REAR P.C.BOARD	25	EDO-SIMM P.C.BOARD
6	F1 SERVO P.C.BOARD	26	CPU P.C.BOARD
7	F2 SYSCON P.C.BOARD	27	FAN SENSOR P.C.BOARD
8	F3 4X MAIN P.C.BOARD, HDD SUB P.C.BOARD	28	RF MOTHER P.C.BOARD
9	F3 4X INTERFACE P.C.BOARD	29	AC HEAD INTERFACE P.C.BOARD
10	F5 VIDEO OUT P.C.BOARD	30	MECHA INTERFACE P.C.BOARD
11	F6 A PROCESS P.C.BOARD	31	FRONT LED P.C.BOARD
12	H1 RF BUFFER P.C.BOARD	32	EJECT P.C.BOARD
13	H2 RF BUFFER P.C.BOARD	33	HEAD BUFFER 1 P.C.BOARD
14	H3 EQ 1 P.C.BOARD, EQ SUB P.C.BOARD	34	HEAD BUFFER 2 P.C.BOARD
15	H4 EQ 2 P.C.BOARD, EQ SUB P.C.BOARD	35	MAIN POWER LED P.C.BOARD
16	H5 CUE/ERASE P.C.BOARD	36	PC POWER SW P.C.BOARD
17	H6 AUDIO D/A 1 P.C.BOARD	37	FAN INTERFACE P.C.BOARD
18	TRV P.C.BOARD	38	HEAD PHONE P.C.BOARD
19	SCSI P.C.BOARD	39	RESET P.C.BOARD
20	X4 PCI INTERFACE P.C.BOARD	40	TRV INTERFACE P.C.BOARD

## 1-5. Alignment Tapes

### DVCPRO Alignment Tape

for NTSC

#### VFM3580KM (NTSC)

Time (min)	Video		PCM		CUE	
	Signal	Purpose	Signal	Purpose	Signal	Purpose
0:00	Color Bar SMPTE(75%)	Composite Video Level Confirmation	1kHz -20dB	Audio Level Confirmation	1kHz 0VU	CUE Level Confirmation  A/C Head Azimuth  Frequency Response
7:00	Color Bar Full Field(75%)	Component Video Level Confirmation				
14:00	H Sweep	Frequency Response			6kHz 0VU	
18:00	Bowtie(500k)	Y/C Timing			1kHz	
22:00	Pulse&Bar	Y/C Timing			300Hz~6kHz	
26:00	Area Markers					
30:00						

#### VFM3581KM (NTSC)

Time(min)	Signal
0:00~20:00	ITI Pattern

#### VFM3582KM (NTSC)

Time(min)	Signal
0:00~10:00	X Value

for PAL

#### VFM3680KM (PAL)

Time (min)	Video		PCM		CUE	
	Signal	Purpose	Signal	Purpose	Signal	Purpose
0:00	Color Bar 100%	Video Level Confirmation	1kHz -18dBu	Audio Level Confirmation	1kHz Reference level	CUE Level Confirmation  A/C Head Azimuth  Frequency Response
10:00	H Sweep	Frequency Response				
14:00	Area Markers				6kHz Reference level	
18:00	Bowtie(500k)	Y/C Timing			1kHz	
22:00	Pulse & Bar	Y/C Timing			300Hz~6kHz	
26:00	Multi Pulse	Y/C Timing				
30:00						

#### VFM3681KM (PAL)

Time (min)	Signal
0:00 ~ 20:00	ITI Pattern

#### VFM3682KM (PAL)

Time (min)	Signal
0:00 ~ 10:00	X Value

## Recommended Test And Service Equipment

### NTSC

Part No.	Name	Remark
TSG130A(OP.04)	Analog Component Signal Generator	TEKTRONIX
2467B	400MHz Oscilloscope	TEKTRONIX
1760(OP.SC) or 1780R	SCH Meter	TEKTRONIX
520A	Vector Scope	TEKTRONIX
	Digital Volt Meter	
	Frequency Counter	
	VTVM	Frequency Band Width 4Hz-500KHz
	Audio Analyzer	

### PAL

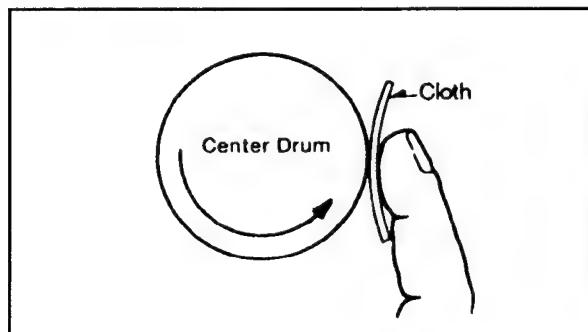
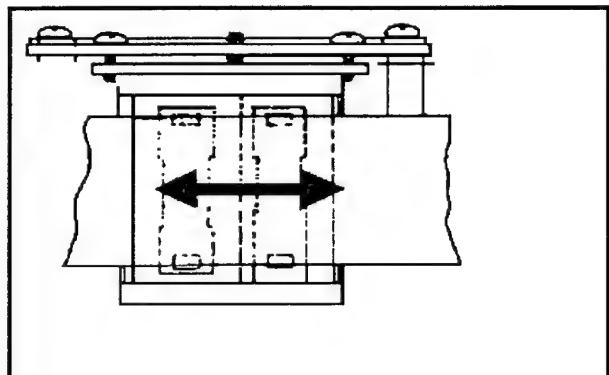
Part No.	Name	Remark
TSG131A(OP.04)	Analog Component Signal Generator	TEKTRONIX
2467B	400MHz Oscilloscope	TEKTRONIX
1751(OP.SC) or 1781R	SCH Meter	TEKTRONIX
	Digital Volt Meter	
	Frequency Counter	
	VTVM	Frequency Band Width 4Hz-500KHz
	Audio Analyzer	

## 2. Cleaning Procedures

Make sure the power is OFF before cleaning. Use ethanol(more than 99% purity) as cleaning liquid.

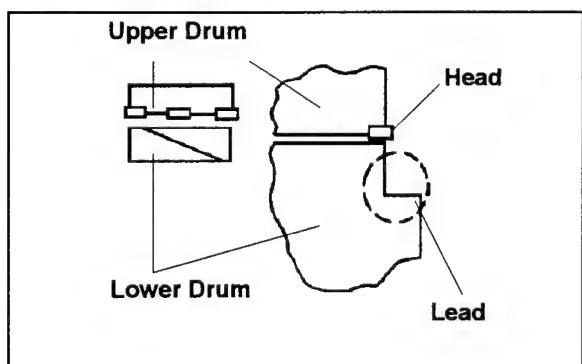
### 2-1. Cleaning of Head Chips :(Daily)

Clean heads by applying even pressure and rotating cylinder a few times. Never wipe in up and down motion. Never touch a cylinder by naked hand. First wipe with a cloth soaked by cleaning liquid. Then wipe with dry cloth.



### 2-2. Cleaning of Drum Lead :(Weekly)

Be careful not to touch a head chip. Clean the drum lead with a pick.

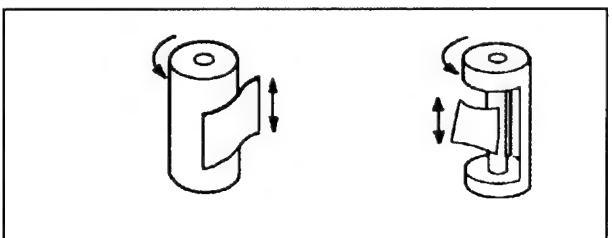


### 2-3. Cleaning of A/C Head :(Weekly)

Wipe the A/C head with a cloth soaked by cleaning liquid. Wipe again with a dry cloth.

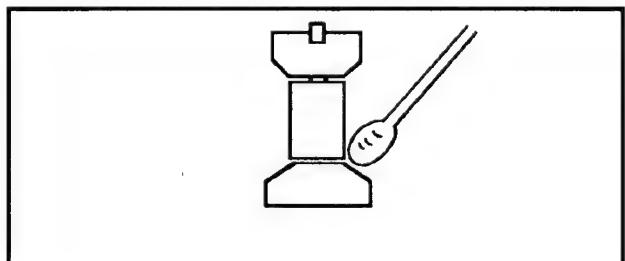
### 2-4. Cleaning of Pinch Roller and Capstan :(Weekly)

Wipe the Pinch Roller and Capstan with a cloth soaked by cleaning liquid.



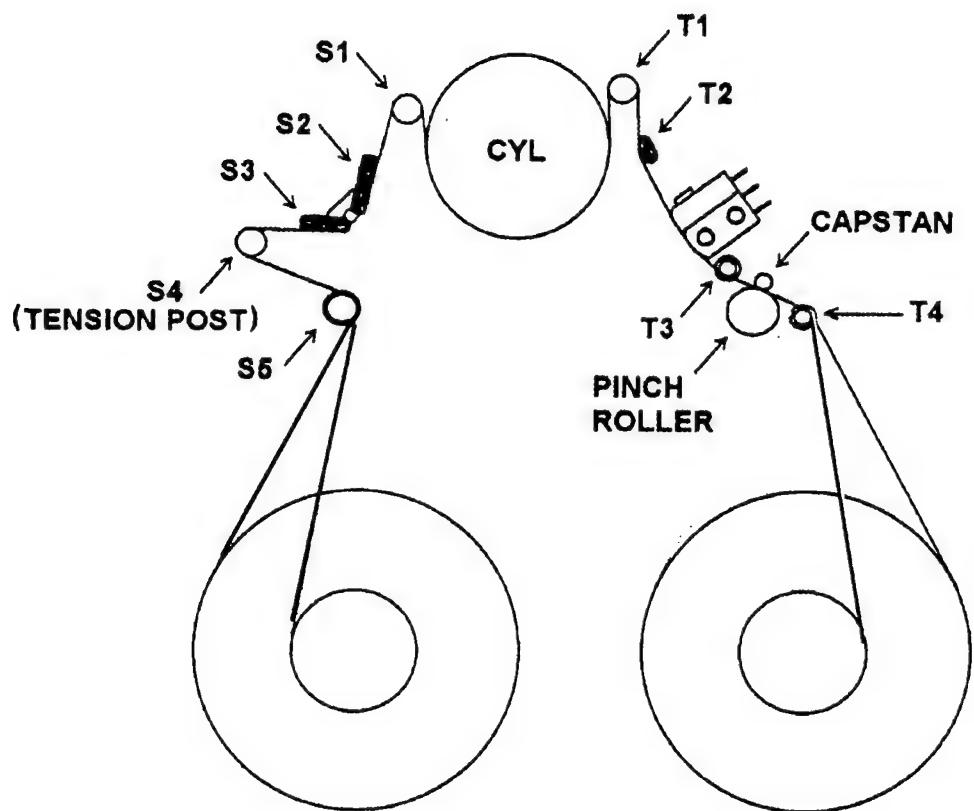
### 2-5. Cleaning of Post :(Weekly)

Wind a cloth on a pick. Wipe each post dry with that pick . Wipe again with a dry cloth. For metal posts wipe with cleaning liquid. Then wipe dry again.



### 3. Mechanism Adjustment

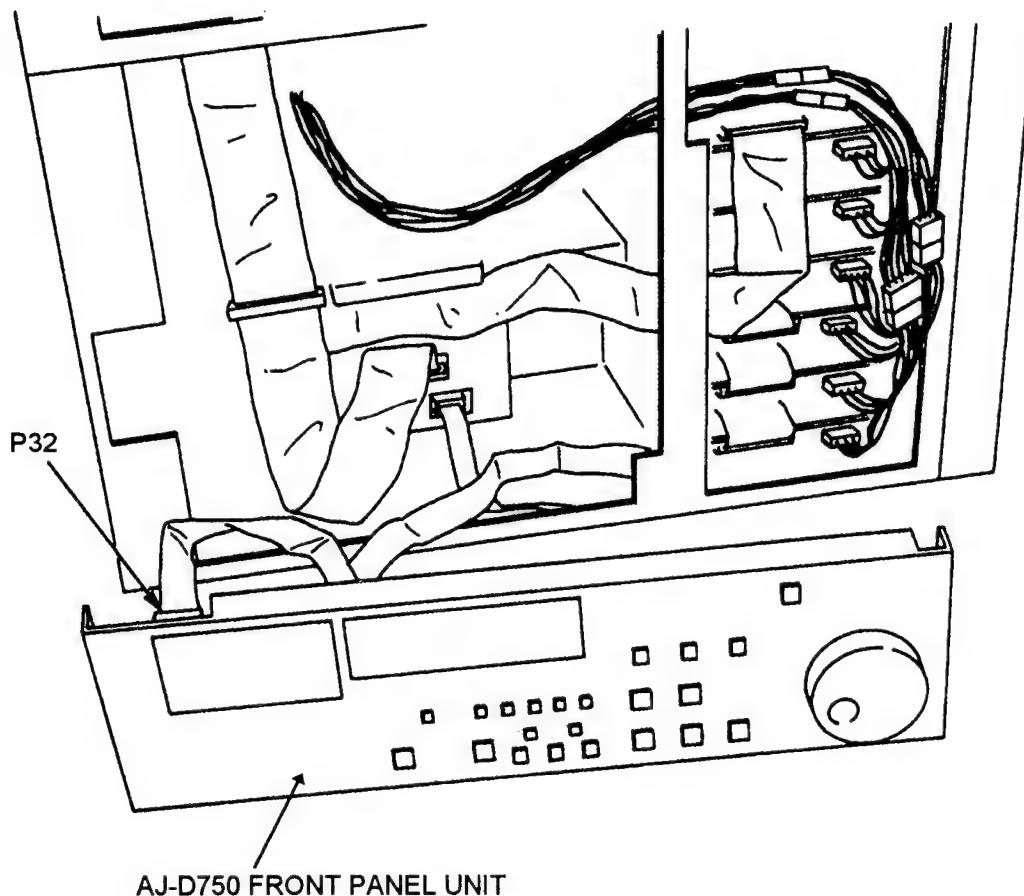
#### 3-1. Name of tape transportation



## Preparation

If you try to make a mechanical and/or electrical adjustment, remove the Front Panel of the AJ-D750, and make connection with the AJ-DE77 by performing the following procedure:

1. Remove the Right Sided Panel.
2. Connect P32 in the News byte to the Front Panel of the AJ-D750.



### 3. Setting on the Front Panel

DIP SW:                    Only SW1 ON (in the Service Menu mode)

                              Only SW4 ON (in the User Menu mode)

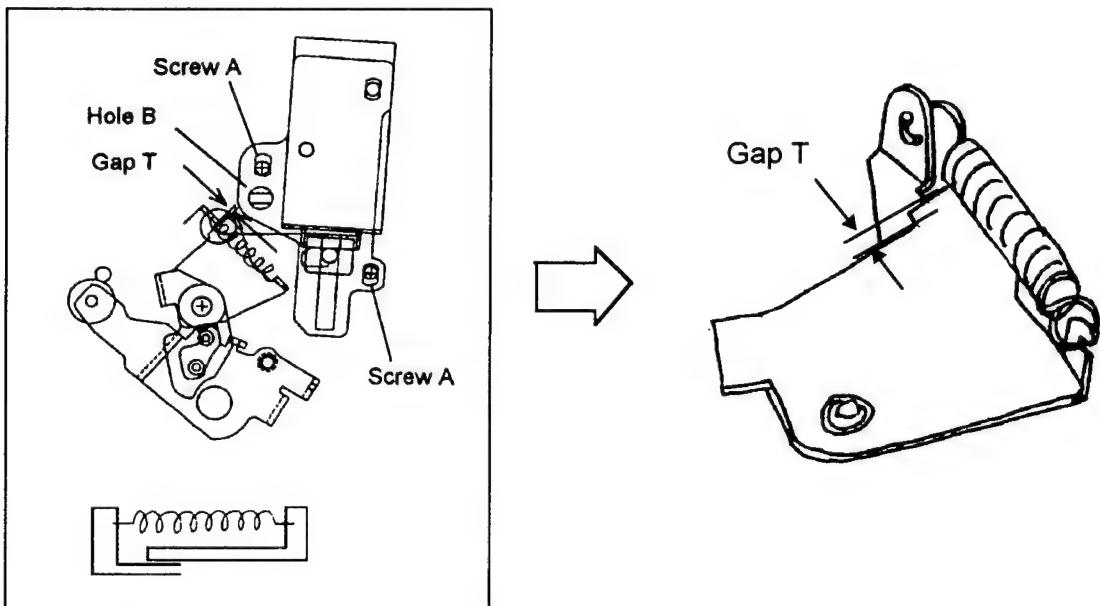
CONTROL:                   LOCAL side

**Note:** Be sure to turn OFF the unit before attempting to make connection or disconnection of the Front Panel.

### 3-2. Pinch Solenoid Position Adjustment

Specification	T = 0.3 mm
Mode	EJECT
Test Point	Gap T
Equipment and tool	VFK0357
Adjustment	Hole B

1. Turns power off, and close the pinch roller to the capstan shaft by hand.
2. Press the pinch solenoid by your hand so that the pinch roller is engaged to the capstan shaft.
3. Loosen the screw A and adjust Hole B by VFK0357 so that the gap "T" portion is in the specification.
4. Tighten the screw A after adjustment.



### 3-3. Main Brake Torque Confirmation

Specification	Tighten Direction more than 80 gcm Loosen Direction more than 15 gcm
Mode	—
Test Point	Reel Table
Equipment and tool	VFK71 (150 g torque meter) VFK1191 (45 g torque meter) VFK1152 (Adapter)

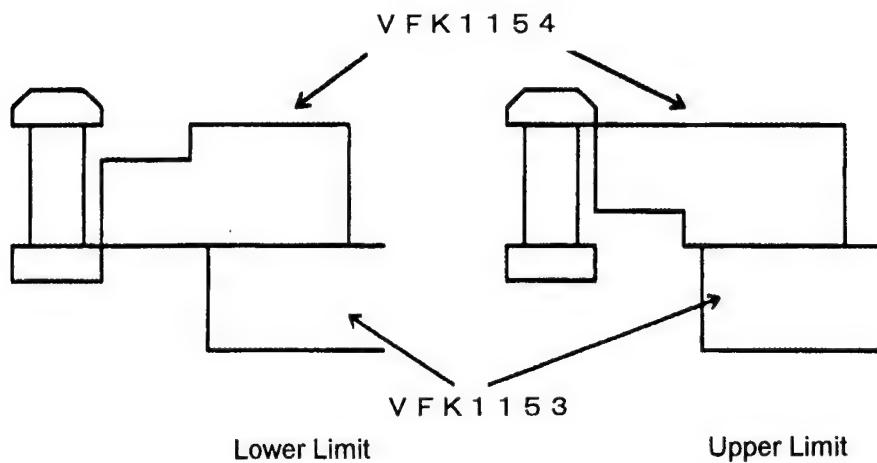
1. Remove the front loading unit.
2. Attach the Adapter (VFK1152) with the torque meter and attach the torque meter with the reel. Then rotate the torque meter and read the value when the brake is release and the reel starts rotation both CW and CCW direction for both reel tables.

### 3-4. Post Height Pre-Adjustment

Name	Limit	Post Driver	
S4 Post	* Lower	VFK1149	
S5 Post	* Lower	VFK1149	
T3 Post	Lower	VFK1151 (2.5 mm Nut Box )	
T4 Post	Lower	VFK1151 (2.5 mm Nut Box )	

\* :Turn S4 and S5 posts 1 round more counter clockwise from Lower Limit position.

Tool	VFK1153 (Mech. Plate), VFK1154 (Flange Tool ) VFK1149, VFK1151
Mode	EJECT (Power OFF )



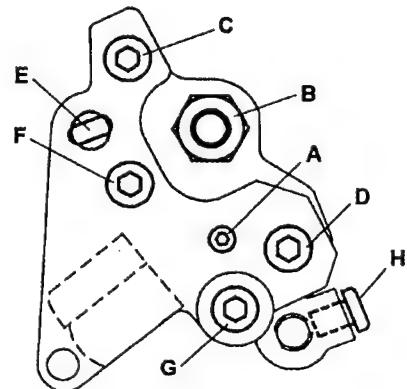
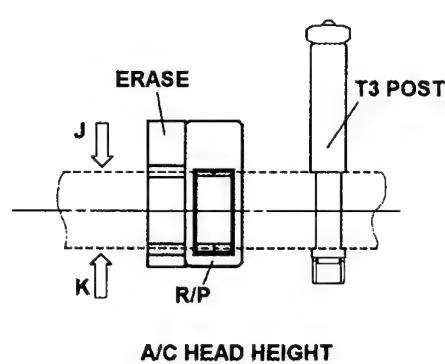
1. Confirm the Reel Table is located at M cassette position. If it is located at L cassette position, turns power on and insert M cassette and eject the M cassette.
2. Turns power off. Remove the front loading unit. Place the Mech. Plate (VFK1153) on the Reel Table.
3. Place the flange tool (VFK1154) as shown in the figure and adjust the post height.
4. Adjust the S4 and S5 post height by VFK1149 and adjust T3 and T4 by VFK1151.

### 3-5. A/C Head Height Pre Adjustment

Name of Adjustment	Screw	Adjustment	Tool
A/C Head Tilt	A	Screw A is not loosen.	VFK1178 (0.89 mm)
A/C Head Height	B	Adjust the height so that Cue R/P head is located at lower limit of the T3 post.	VFK1150 (5.5 mm)
A/C Head Horizontal Position	C	Adjust the hole E, and slightly tighten the screw.	VFK1148 (1.5 mm)
	D	Adjust E at center position.	VFK0357
A/C Head Azimuth	F	Adjust the A/C head straight.	VFK1148 (1.5 mm)
A/C Head screws	G	Tighten the screw.	VFK1148 (1.5 mm)
	H	Adjust the height by screw B and slightly tighten it.	VFK1190

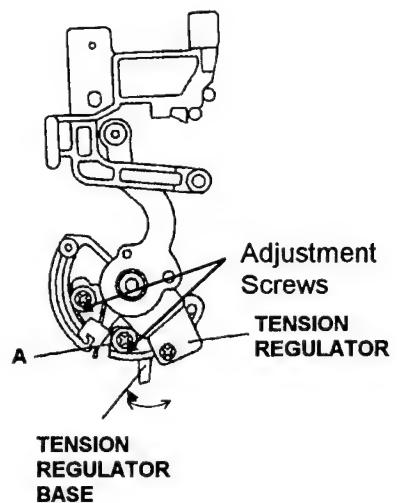
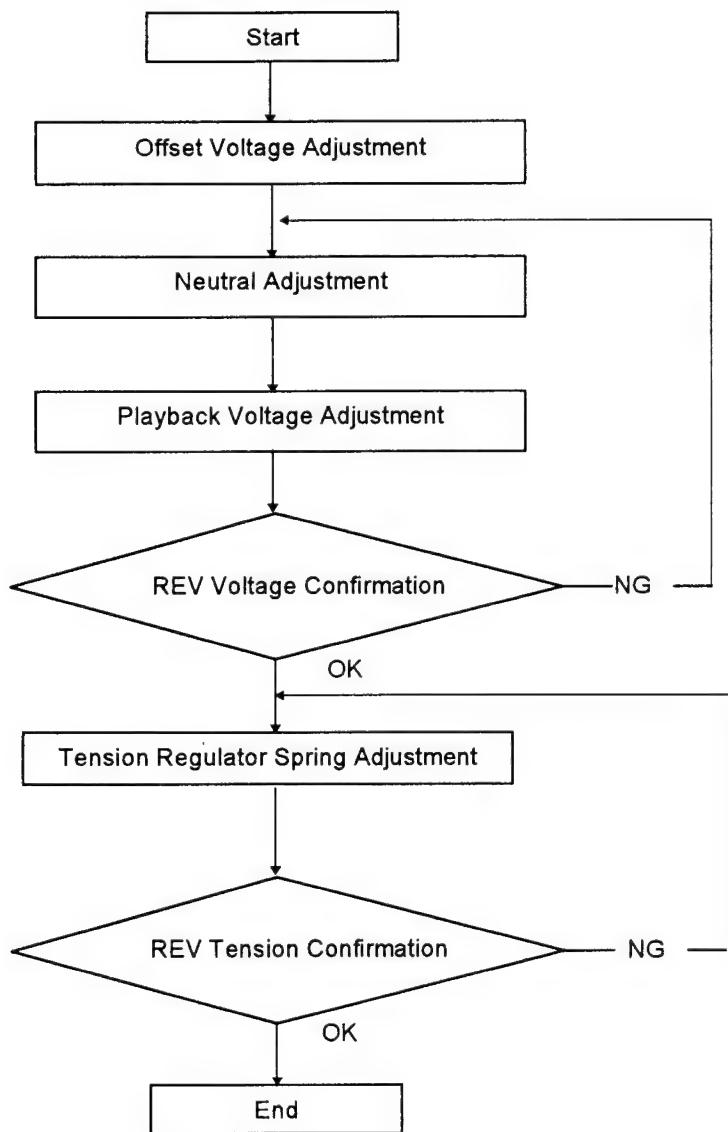
Torque of the each screw	C, D	2.5 kg cm
	G	1.0 kg cm

1. A/C Head Tilt Pre Adjustment  
Confirm the screw A is toughed with the A/C head connection plate and it is not loosen.
2. A/C Head Pre Horizontal Position Adjustment  
Loosen the screw C and D and adjust the hole E so that the position is at center and slightly tighten the screw C and D.
3. A/C Head Pre Height Adjustment  
Adjust the A/C Head Height so that the Cue R/P head is located at the lower limit of the T3 post.
4. A/C Head Pre Azimuth Adjustment  
Adjust the A/C Head Azimuth is parallel to the T3 post flange.
5. A/C head screws  
Tighten the each screw according with the upper table and confirm the each adjustment again.



### 3-6. Tension Arm Adjustment Procedures

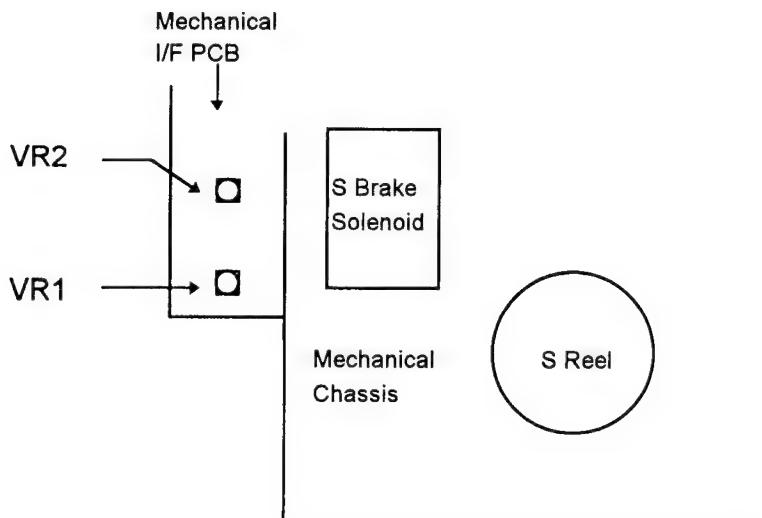
When this adjustment is done, melt the grew of the adjustment screws.



### 3-7. Tension Arm Offset Voltage Adjustment

Specification	$2.5 \pm 0.05(V)$
Mode	EJECT
Test Point	TP201(Servo board : F1)
Equipment	Digital Volt meter
Adjustment	VR1( Mech. I/F board: bottom of Mechanism )

1. Adjust VR1 so that the DC voltage at TP201 is in the specification in EJECT mode



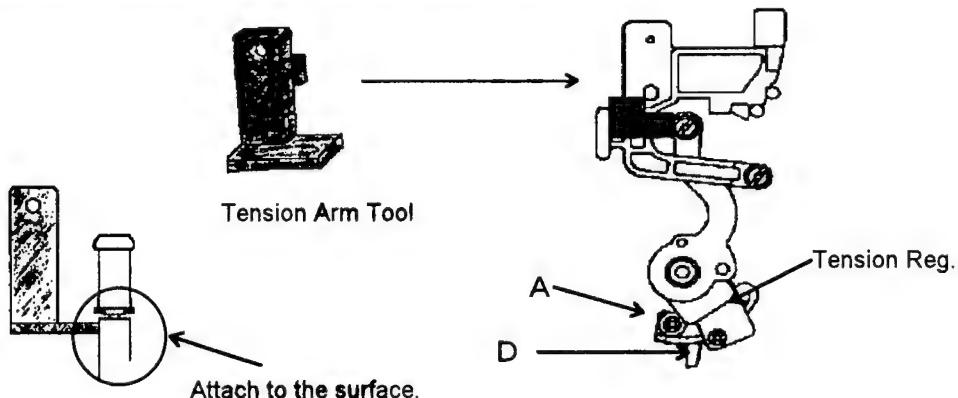
(Top view)

### 3-8. Tension Arm Neutral Position Adjustment

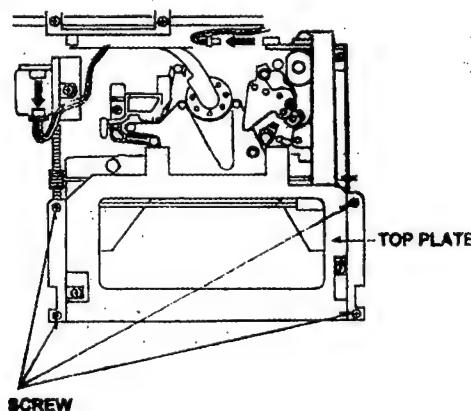
Specification	2.5 V $\pm$ 0.1 V
Mode	STOP
Test Point	TP201(Servo board : F1)
Equipment	Digital Volt meter or Oscilloscope
Adjustment	Tension Regulator Board Position
Tool	VFK1208 (Tension Arm Tool: neutral, black, with hole)

1. Unscrew the 4 screws and remove the Top Plate on the front loading unit.
2. Set the VFK1208.
3. [Connect the Digital Volt meter to TP201 on F1 board] then move the tension regulator board so that the voltage at TP201 is in the specification.
4. Place the unit into the no tape loading mode (Refer to No tape loading procedure described as below).  
The tension regulator board adjustment procedures are as follows.

- Loosen screw A. Move the D portion with tweezers which are not magnetized. Then tighten the screw A.
- [No tape loading procedures are as follows.]  
Turns DIP SW1 ON at back of Front panel. Press the INSERT CH1 button and press the MENU button, then service menu is appeared on the MON OUT. Select the "A00 SERVO" and press the SET button and select "A02 T TORUQUE" by JOG dial, and press JOG/SHTL key, and loading is started. During adjustment, hold the JOG / SHTL key.



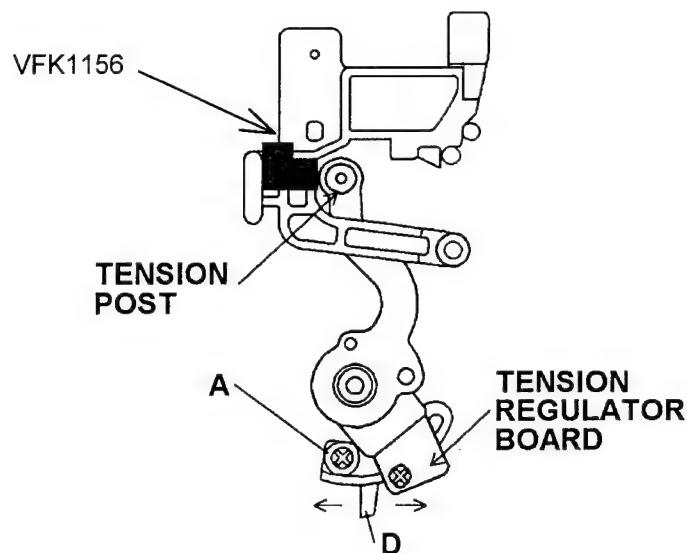
**CAUTION:** Don't touch the magnetize screw driver to S-Reel FG magnet portion, when the "D" portion is adjusting.



### 3-9. Tension Arm PLAY Voltage Adjustment

Specification	$3.8 \pm 0.05(V)$
Mode	STOP
Test Point	TP201(Servo board : F1)
Equipment	Digital Volt meter
Adjustment	VR2 (Mech. I/F board : See 4-7 Offset Adjustment)
Tool	VFK1156

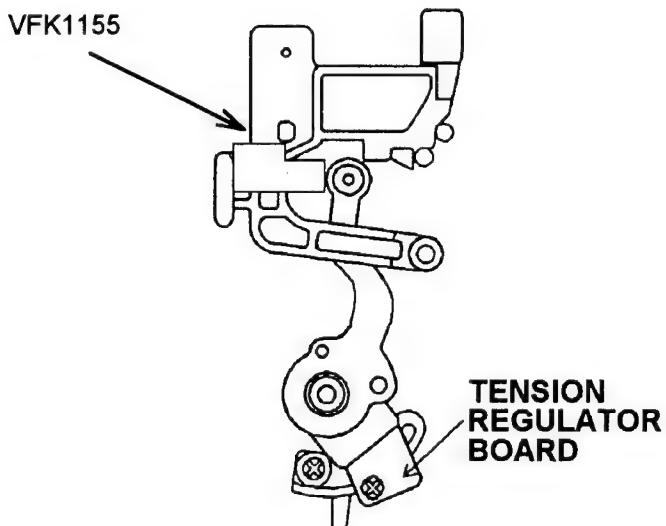
1. Set the VFK1156 at the suitable position. (Tension Arm Tool : Play, Black color )
2. Place into loading mode without a tape.
3. Adjust VR2 so that the Specification of TP201 in STOP mode is in the specification.  
(Refer to item 3- 7 . Tension Arm Offset Voltage Adjustment)



### 3-10. Tension Arm REV Voltage Confirmation

Specification	1.2±0.3(V)
Mode	STOP
Test Point	TP201 (Servo board : F1)
Equipment	Digital Volt meter
Adjustment	
Tool	VFK1155 (Tension Arm Tool : REV, White )

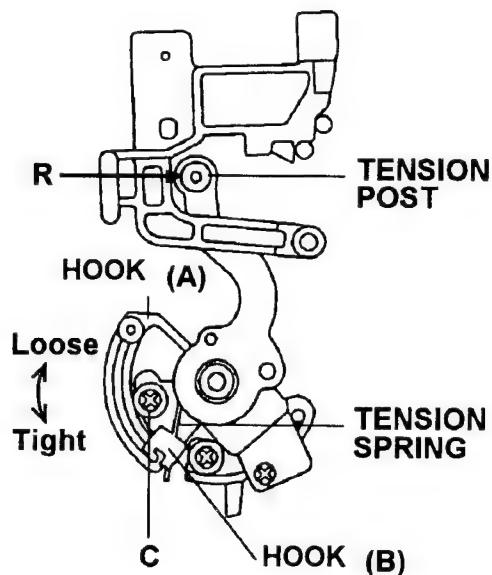
1. Set VFK1155 (Tension Arm Tool : REV, White )to the specified position.
2. Place the VTR into the no tape loading.
3. Confirm the voltage at TP201 is in the specification in STOP mode.
4. If it is out of specification, adjust "4-8. Tension Arm Neutral Position Adjustment".



### 3-11. Tension Arm Tension Regulator Spring Adjustment

Specification	11±1(g)
Mode	STOP
Test Point	TP201 (Servo board : F1)
Equipment	Digital Volt meter
Adjustment	Tension Regulator Spring Hook (B) Position
Tool	VFK1188 (30g Dial Tension Gauge)

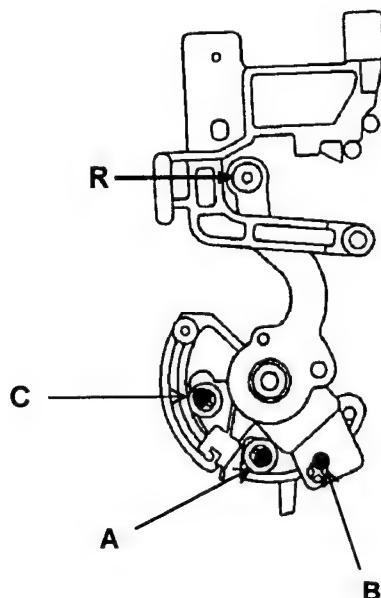
1. Place the VTR into no tape loading.
2. Press the post at the R position by Dial Tension Gauge until the voltage at TP201 is 3.8 V (Play position).
3. Adjust Tension Regulator Spring Hook (B) so that the tension is in the specification.  
Adjust the Tension Regulator Hook (B) position as follows.
  - Loosen screw C.
  - Adjust the position.
  - Tighten screw C.



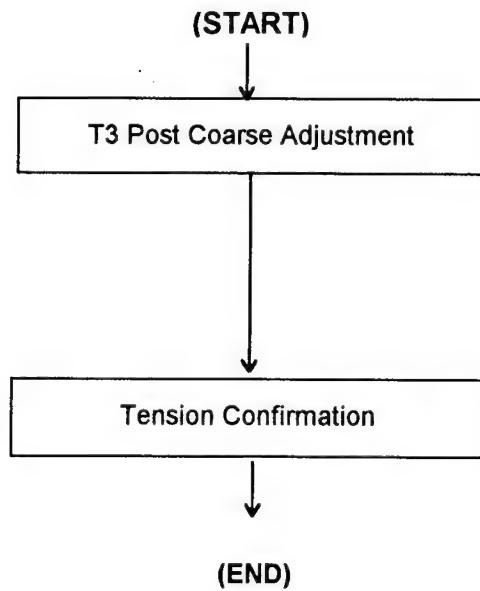
### 3-12. REV Tension Confirmation

Specification	REV Tension : $18 \pm 2$ (g)
Mode	STOP
Test Point	TP201 (Servo board : F1)
Equipment	Digital Volt meter
Adjustment	
Tool	VFK1188 (30g Dial Tension Gauge)

1. Place the VTR into no tape loading.
2. Press the post at the R position by Dial Tension Gauge until the voltage at TP201 is 1.2 V (REV position).
3. Confirm the tension is in the specification. If it is not, adjust Tension Regulator Adjustment again.
4. Apply a lock tight grew to the screw A, B and C after Tension Arm adjustment. The lock tight grew quantity at B is half of A and C.



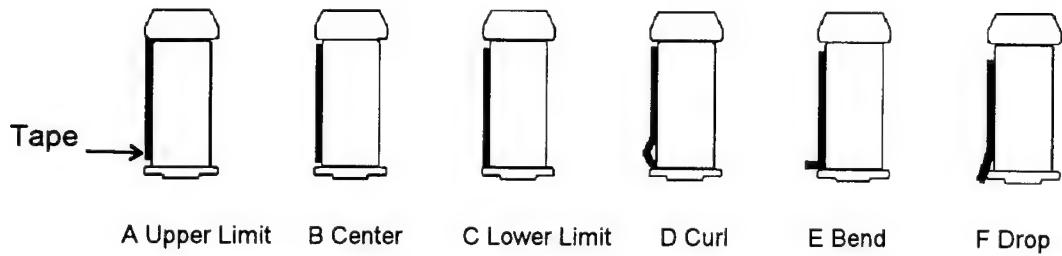
### 3-13. Tension Confirmation Procedures



### 3-14. T3 Post Coarse Adjustment

Specification	A, B, C shows good condition, D, E, F shows bad condition.
Mode	PLAY
Adjustment	T3 Post Height
Tool	VFK1151 (Box Driver 2.5 mm)
Tape	Working Tape (This adjustment may damage the tape.)

Place the unit into PLAY mode and adjust T3 Post height so that the tape runs without any tape damage.

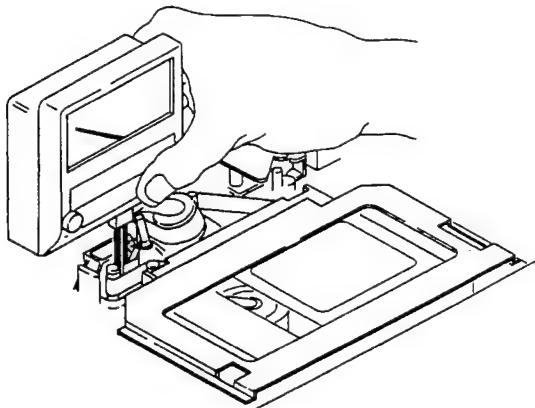


### 3-15. Play Mode Tension Confirmation

Specification	6±1 g FWD (×1)
Tool	VFK1145 (Back Tension Meter)

1. Playback the beginning part of the 63 min Tape.
2. Insert the back tension meter between S3 and S4 post (Tension arm).
3. Confirm the tension is in the specification.

**NOTE: Be careful not to give some tape damage.**

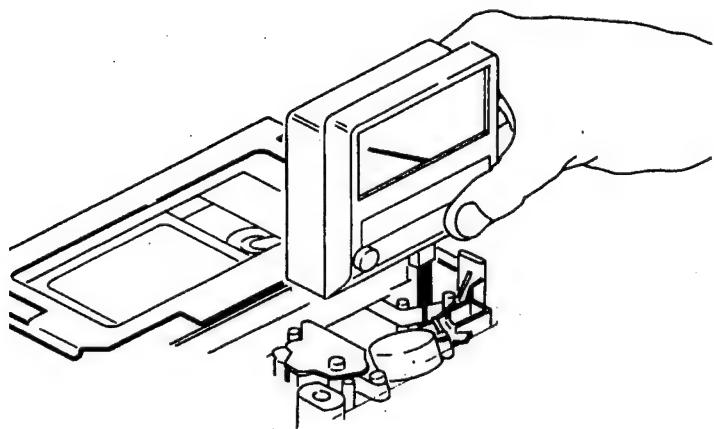


### 3-16. Reverse Tension Confirmation

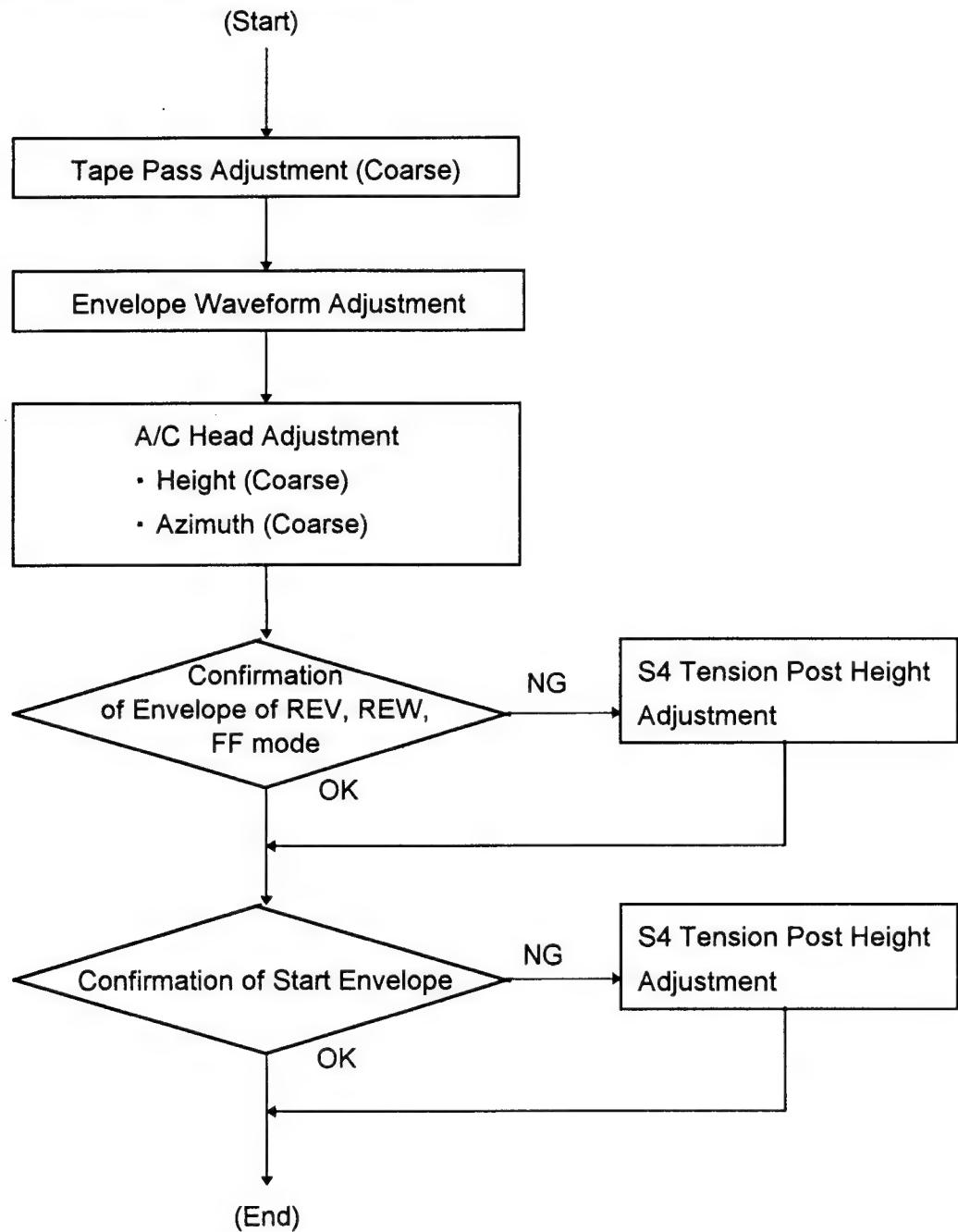
Specification	9±2g REV (× 1)
Tool	VFK1145 (Back Tension Meter)

1. Set the 63 min Tape and place the unit into Reverse mode.
2. Insert the back tension meter between S5 and S4 post (Tension arm).
3. Confirm the tension is in the specification.

**NOTE: Be careful not to give some tape damage.**



### 3-17. Tape Pass Adjustment Procedures



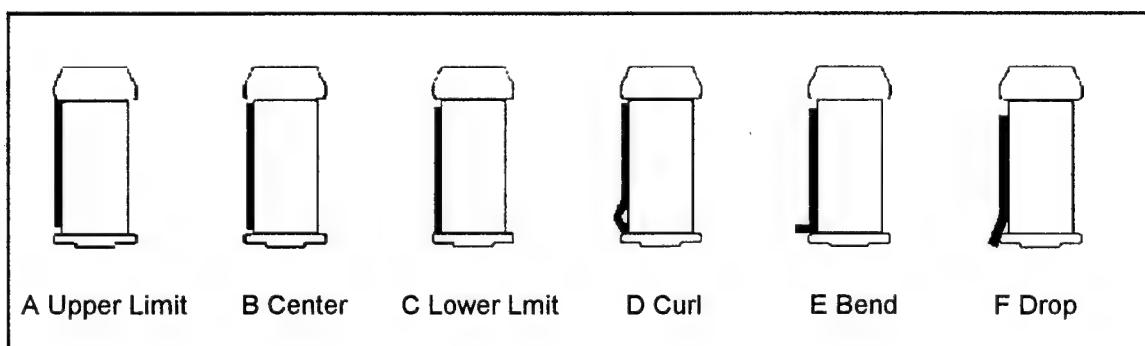
### 3-18. Tape Pass Adjustment (COARSE) and Tape Pass Limit Confirmation

Specification	Confirm the each post limitation is as shown in the table.
Mode	FWD × 1
Adjustment	A/C Head Screw
Tool	VFK1149 (Post Driver) VFK1150 (Box Driver 5.5mm) VFK1151 (Box Driver 2.5mm) VFK1178 (0.89mm) . . . Screw A VFK1148 (1.5mm) . . . Screw G
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 Post		O	O	X	X	X	S5 Post	
S4 Tension Post	X		O	X	X	X	Tension Post Height	
S1 Post	O	X	X	X	X	X	Envelope Adjustment	
T1 Post	O			X	X	X	CTL Adjustment	
A/C Head								
T3 Post	X	X	O	X	X	X	T3 Post Height	
T4 Post	X	O	O	X	X	X	T4 Post Height	

O means acceptable.      X means not acceptable.

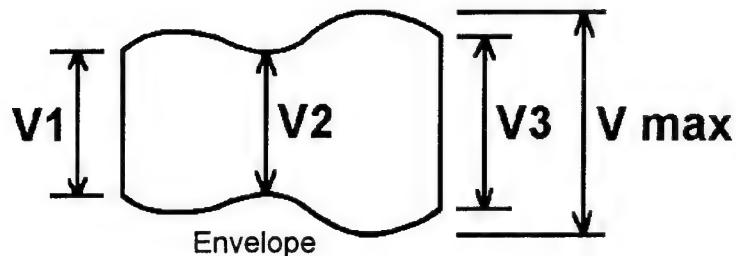
1. Place unit into FWD × 1 mode, and adjust the height of each post do not to occurred tape damage.
2. Regarding the S1 Post, T1 Post and A/C Head adjustment, refer to item "Envelope Waveform Adjustment" and A/C Head Azimuth Adjustment".
3. Confirm the tape pass limit of each post as below figure.



### 3-19. Envelope Waveform Adjustment

Specification	$V1/V_{max}, V2/V_{max}, V3/V_{max} \geq 0.8$
Mode	ATF Control PLAY mode
Test Point	TP16: R/P envelope (RF Board:H4) TP1: TRIG. (RF Board:H4)
Equipment	Oscilloscope
Adjustment	S1, T1 Post Height
Tool	VFK1149 (Post Driver)
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

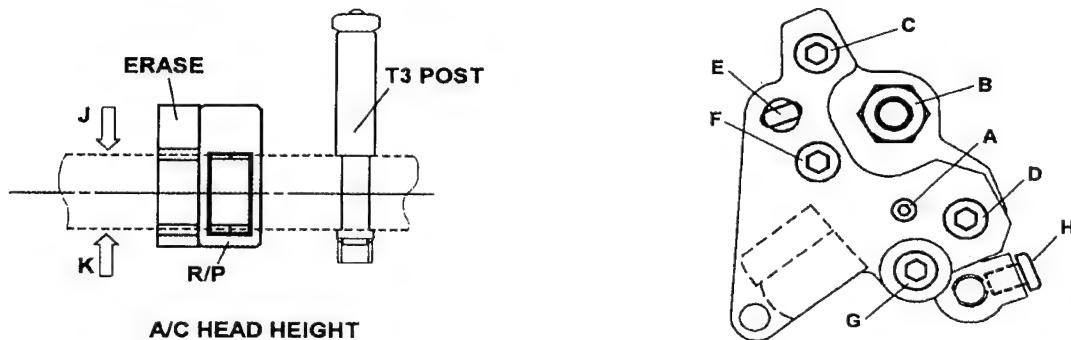
1. Playback the color bar portion of the alignment tape.
2. Adjust S1 and T1 post height so that the R/P envelope output is in the specification.
3. When the S1 and T1 posts are adjusted, first raise the post height and make small the entrance and exit side of the envelope, then down the post until envelope becomes flat.
4. Adjust T1 post and makes exit side of the envelope flat then adjust S1 post.
5. After the adjustment, unload the tape then loading the tape. Confirm the waveform style.



### 3-20. A/C Head Tilt Adjustment

Adjustment Item	Screw	Adjustment Method
A/C Head Tilt Adjustment	A VFK1178	Tighten direction --- Decrease CUE Loosen direction --- Increase CUE
A/C Head Height	B VFK1150	Tighten direction --- Output increase when tape is up (arrow k) Loosen direction --- Output increase when tape is down (arrow j)
Azimuth	F VFK1148	Phase is adjusted by screw F.
A/C Head Horizontal Position (Torque 2.5kg.cm)	C D VFK1209 VFK0912	Adjust X value by VFK0357 (Eccentric screwdriver) at long hole. Then tighten the screw C and D to fix the A/C head horizontal position.
A/C Head Tilt (Torque 1kg.cm)	G Same C and D	Screw G --- Always be tighten during adjustment.
A/C Head Fix	H VFK1190	Screw H --- After height adjustment, tighten the screw H to fix the A/C head height.

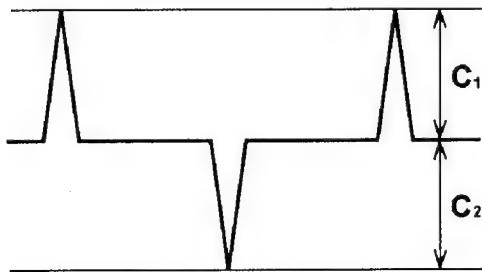
1. Always the screw G must be tightened while each adjustments is done.
2. After the A/C head tilt adjustment, confirm the screw A is not loosen. (The screw A must be touch with the A/C head set plate.)
3. After the A/C head tilt adjustment, confirm the tape damage at T3 post.
4. When A/C head height is adjusted, loosen the screw H to start, and after adjustment completion, tighten screw B.
5. Each adjustment must be completed with tightening the screw.
6. Each adjustment must be alternately adjusted or confirmed with the envelope exit side adjustment.



### 3-21. A/C Head Height Adjustment

Specification	CTL Output : $C1, C2 \geq 1.8(V)$
Mode	FWD $\times 1$
Test Point	TP30 : CTL Output (Servo board : F1)
Equipment	Oscilloscope
Adjustment	A/C Head Screw B, H
Tool	VFK1150 (Box driver), VFK1190 (Hex)
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion) * Dubbing tape is recommendable for prevent damage.

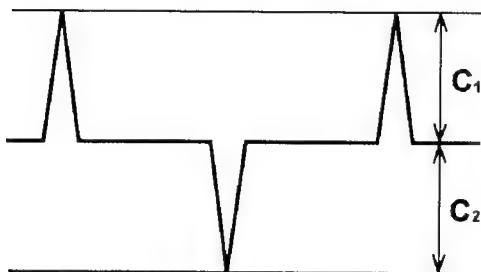
1. Connect the scope to TP30 on the Servo board, and adjust the A/C head height so that the CTL output level is in the specification.
2. To adjust the height, loosen the screw H and adjust by nut B.
3. When A/C head height is changed, the Azimuth is changed also, so adjust A/C head height and A/C azimuth adjustment alternately.
4. When the screw H is tighten, the A/C head tilt is changed, so the confirmation must be done after tightening the screw H.



### 3-22. A/C Head Azimuth Adjustment

Specification	CTL Output : C1, C2 = C1 max, C2 max
Mode	FWD × 1
Test Point	TP30 : CTL Output (Servo board : F1)
Equipment	Oscilloscope
Adjustment	A/C Head Screw F
Tool	VFK1148 (Box driver)
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion) * Dubbing tape is recommendable for prevent damage.

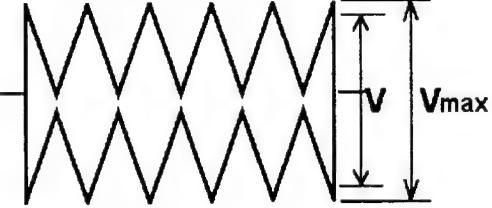
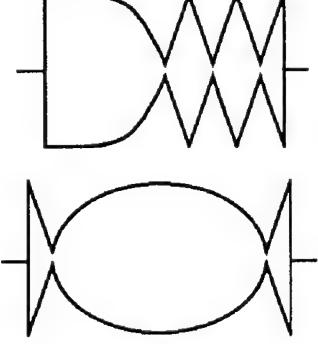
1. Connect the scope to TP30 on the Servo board (F1) and adjust the Screw F so that the CTL Output becomes maximum.
2. When the A/C Head Azimuth is changed, the A/C Head Height is changed also, so adjust A/C head height and A/C azimuth adjustment alternately.



### 3-23. Confirmation of Envelope of REV, REW, FF mode

Specification	Refer to the following figure.
Mode	REV , REW and FF
Test Point	TP16:R/P Envelope (RF board : H4)
Equipment	Oscilloscope
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

#### Envelope waveform confirmation

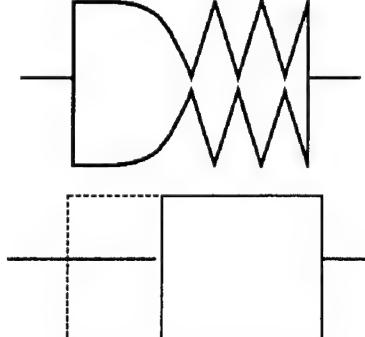
Mode: REV , REW and FF	Evaluation
	<p>OK</p> <ul style="list-style-type: none"> <li>Waveform must be diamond style.</li> <li>All The peak must be more than 90% of the maximum level.</li> </ul> $V/V_{max} \geq 0.9$
	<p>NG</p>

1. Connect the scope to TP16 and confirm the envelope style is in the specification in REV, REW and FF mode.
2. If it is out of specification , adjust S4 Post (Tension Post) Height again.

### 3-24. Confirm of PLAY Start Envelope

Specification	In the Play mode envelope become flat momentarily.
Mode	FF → PLAY REV and REW → PLAY Loading Completion → PLAY
Test Point	TP16 : R/P Envelope (RF Board : H4)
Equipment	Oscilloscope
Tape	Recorded L Cassette (123min.) Tape Begin

#### Envelope Confirmation

PLAY Start	Evaluation
	OK (Envelope becomes flat momentarily)
	NG

1. Observe the envelope by oscilloscope and confirm the envelope is in the specification in the transition from REW to PLAY, from REV to PLAY and Loading completion to PLAY.
2. If it is not adjust S4 Post Height (ITEM 5-27).
3. This adjustment must be done after Envelope Waveform Adjustment.

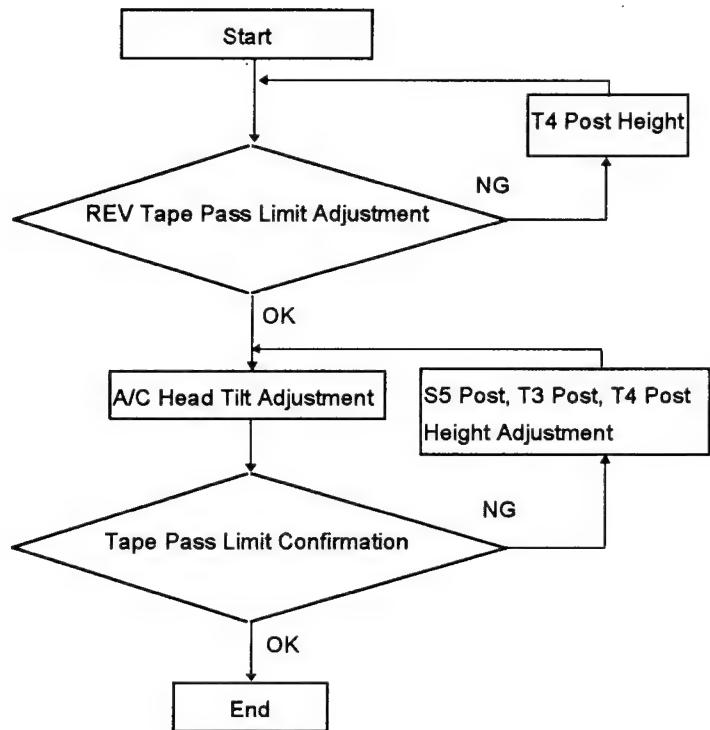
### 3-25. S4 Tension Post Height Adjustment

Specification	Envelope becomes flat momentarily at PLAY start.
Mode	FWD × 1
Adjustment	Tension Post (S4 Post) S1 and T1 Post
Equipment	Oscilloscope
Tool	VFK1149 (Post Driver)
Tape	<b>NTSC:</b> VFM3580KM (Alignment Tape No.1 Color Bar Portion) <b>PAL:</b> VFM3680KM (Alignment Tape No.1 Color Bar Portion)

※ This adjustment should be done when the 3-19 "Envelope Waveform Adjustment", 3-23 "REV, REW, Envelope Waveform Confirmation" or 3-24 "Play Start Envelope Confirmation" can not be achieved the specification.

1. Rotate the S4 tension post height 90 degrees CCW (counterclockwise).
2. Adjust S1 and T1 post height again. Refer to the 3-19 "Envelope Waveform Adjustment".
3. Confirm the Play Start envelope waveform (Item 3-24).
4. If it is not in the specification, repeat item 1 to 3. The maximum rotation angle is 360 degrees.
5. Even the height is out of specification, confirm 3-4 "Post Height Pre-Adjustment".

### 3-26. Tape Limitation Confirmation Procedures



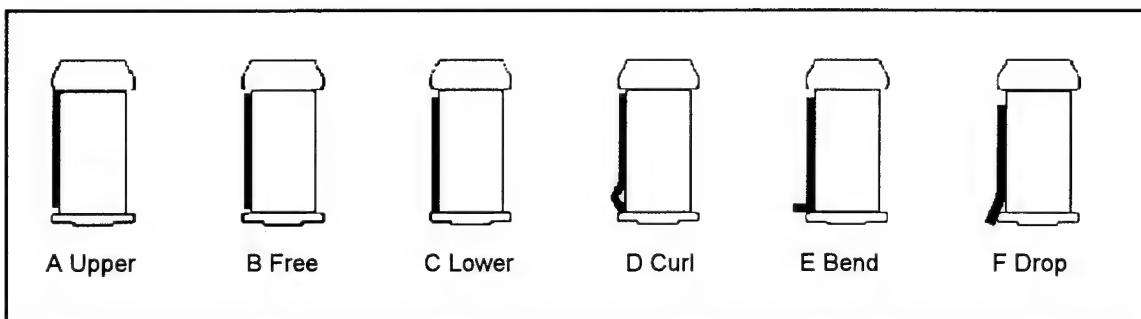
### 3-27. REV Tape Pass Limit Adjustment

Specification	Confirm the each post limitation is as shown in the table.
Mode	REV x 1
Tool	VFK1149 (Post Driver) VFK1151 (Box Driver 2.5mm) VFK1178 (0.89mm) ··· Screw A VFK1148 (1.5mm) ··· Screw G
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 Post	○	○	○	×	×	×	S5 Post	
S4 Tension Post	×	○	○	×	×	×	Tension Post Height	
S1 Post	○	×	×	×	×	×	(Envelope Adjustment)	
T1 Post	○	○	○	×	×	×		
T3 Post	×	×	○	×	×	×	T3 Post Height	
T4 Post	×	×	○	×	×	×	T4 Post Height	

○ means acceptable. × means not acceptable.

1. Place unit into REV mode, and adjust T4 so that the Lower limit touch the tape.
2. Confirm the T4 post is at lower limit, then adjust T3 post is at lower limit.
3. Confirm the tape pass limit of each post.
4. These adjustment must be done after envelope waveform adjustment.

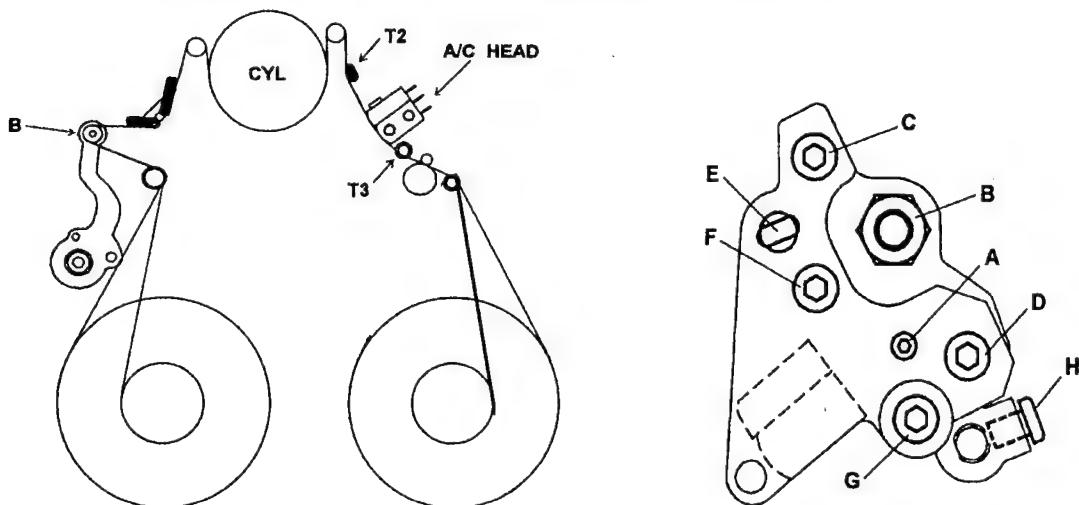


### 3-28. A/C Head Tilt Adjustment

Specification	T3 post must be lower limit in PLAY mode. No tape damage and no tape curling
Mode	PLAY
Adjustment	A/C Head screw A, G
Tool	VFK1178 (0.89 mm) --- Screw A VFK1148 (1.5 mm) --- Screw G
Tape	NTSC: VFM3580KM (Alignment Tape No.1 Color Bar Portion) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

Adjustment Item	Screw	Adjustment Method
A/C Head Tilt Adjustment	A	Tighten direction --- Tape is up by T3 Post. Loosen direction --- Tape is down by T3 Post.
A/C Head Fix (Torque = 1.0 kg cm)	G	Keep tightening for each adjustment.

1. This adjustment must be done after "REV Tape Pass Limit Adjustment".
2. Place the VTR in PLAY mode, and confirm the T3 Post limit and adjust A/C head tilt is in the specification.
3. When complete the A/C head adjustment, final direction of screw rotation must be tighten direction.
4. Adjust alternately with each A/C head adjustment (Azimuth, Height ).



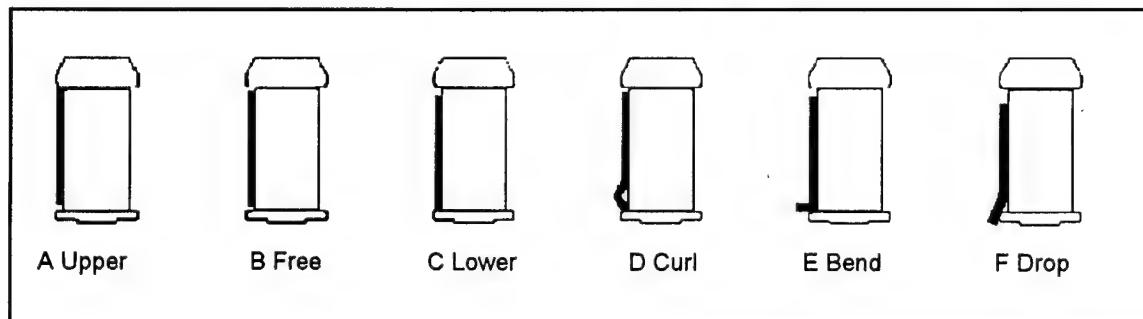
### 3-29. PLAY Tape Pass Limit Confirmation

Specification	Confirm the each post limitation is as shown in the table.
Mode	PLAY
Tool	VFK1149 (Post Driver) VFK1151 (Box Driver 2.5mm) VFK1178 (0.89mm) ... Screw A VFK1148 (1.5mm) ... Screw G
Tape	M Cassette (MP Tape) Tape Begin and Tape End

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 Post	×	○	○	×	×	×	S5 Post	
S4 Tension Post	×	×	○	×	×	×	Tension Post Height	
S1 Post	○	×	×	×	×	×	(Envelope Adjustment)	
T1 Post	○	×	×	×	×	×		
T3 Post	×	×	○	×	×	×	T3 Post Height A/C Head Tilt	
T4 Post	×	○	○	×	×	×	T4 Post Height	

○ means acceptable. × means not acceptable.

1. Place unit into PLAY mode, and confirm the each post limit is in the specification as shown in the upper table.
2. This adjustment must be done after "Envelope Waveform Confirmation".
3. If it is out of specification, adjust each item again.
4. If A/C head tilt is out of specification adjust "A/C Head Tilt Adjustment".
5. Regarding T3 and T4 posts, confirm and adjust "REV Limit Confirmation" and "Loading Limit Confirmation" alternately.



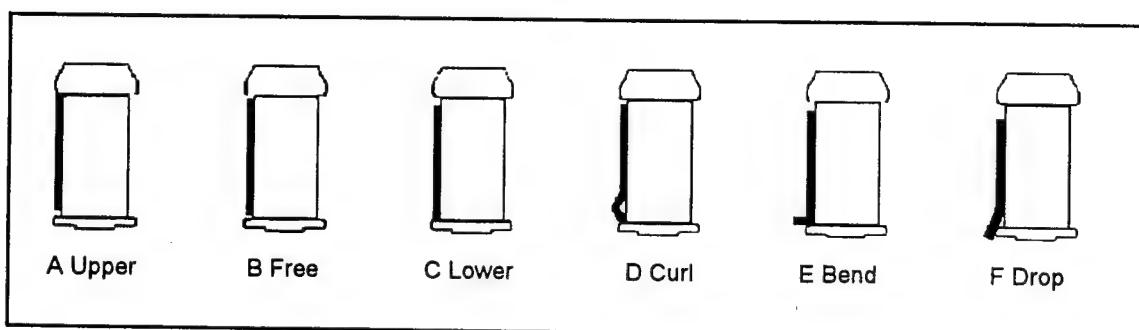
### 3-30. REV Tape Pass Limit Confirmation

Specification	Confirm the each post limitation is as shown in the table.
Mode	REV
Tool	VFK1149 (Post Driver) VFK1151 (Box Driver 2.5mm)
Tape	M Cassette (MP Tape) Tape Begin and Tape End

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 Post	○	○	○	×	×	×	S5 Post	
S4 Tension Post	×	○	○	×	×	×	Tension Post Height	
S1 Post	○	×	×	×	×	×	(Envelope Adjustment)	
T1 Post	○	○	○	×	×	×		
T3 Post	×	×	○	×	×	×	T3 Post Height	
T4 Post	×	×	○	×	×	×	T4 Post Height	

○ means acceptable. × means not acceptable.

1. Place unit into REV mode, and confirm the each post limit is in the specification as shown in the upper table.
2. This adjustment must be done after "Envelope Waveform Confirmation".
3. If it is out of specification, adjust each item again.
4. This adjustment should be done alternately with PLAY Limit Adjustment.
5. If adjust T3 post, confirm "Loading Limit Confirmation".



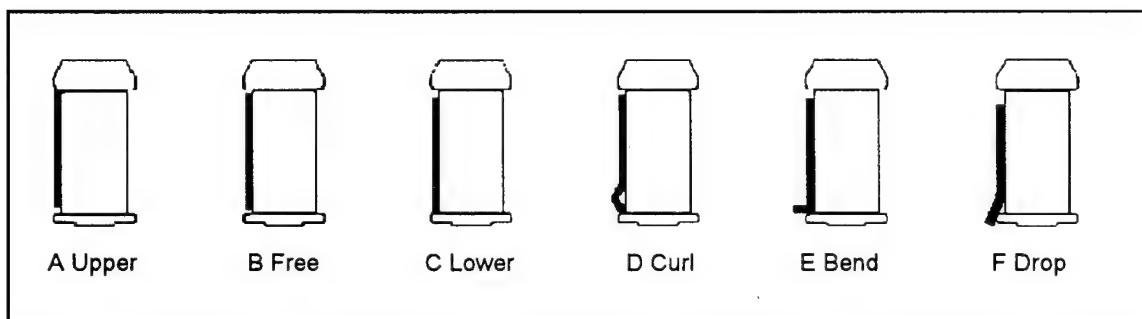
### 3-31. FF, REW Tape Pass Limit Confirmation

Specification	Confirm the each post limitation is as shown in the table.
Mode	FF, REW
Tool	VFK1149 (Post Driver) VFK1151 (Box Driver 2.5mm)
Tape	M Cassette (MP Tape) Tape Begin and Tape End

Post Name	Tape Limit (Refer the figure)						Adjustment	
	A	B	C	D	E	F		
S5 Post	○	○	○	×	×	×	S5 Post	
S4 Tension Post	×	○	○	×	×	×	Tension Post Height	
S1 Post	○	×	×	×	×	×	(Envelope Adjustment)	
T1 Post	○	○	○	×	×	×		
T3 Post	○	○	○	×	×	×	T3 Post Height	
T4 Post	×	○	○	×	×	×	T4 Post Height	

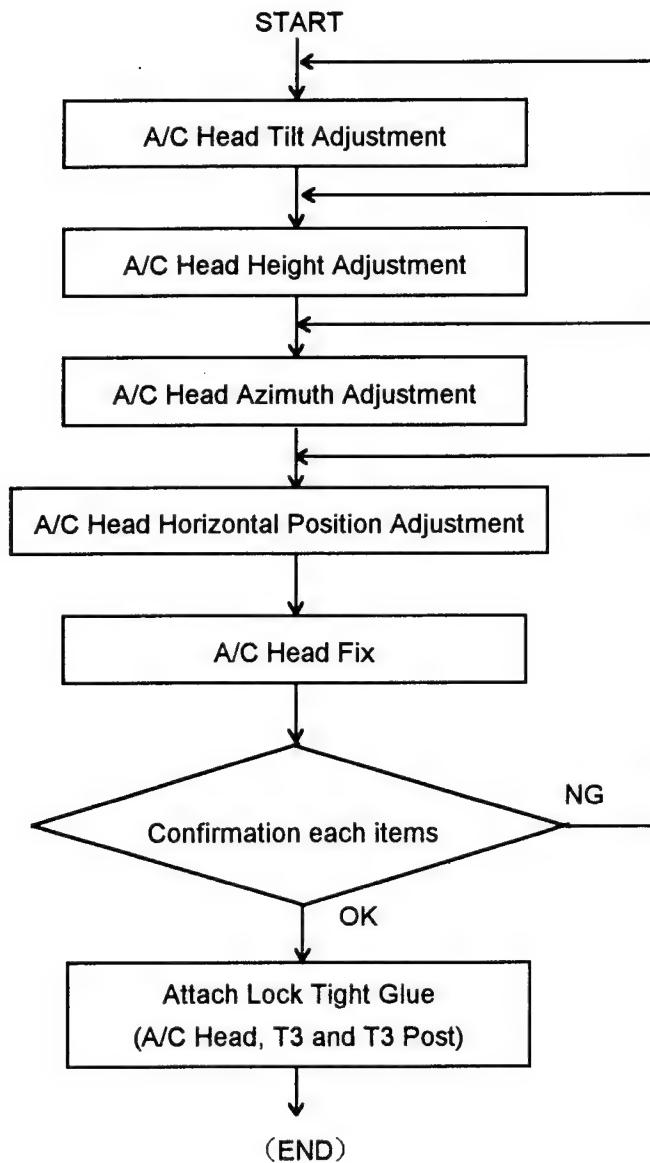
○ means acceptable. × means not acceptable.

1. Place unit into FF and REW mode, and confirm the each post limit is in the specification as shown in the upper table.
2. This adjustment must be done after "Envelope Waveform Confirmation".
3. If it is out of specification, adjust each item again.
4. This adjustment should be done alternately with PLAY Limit Adjustment.
5. If adjust T3 post, confirm "Loading Limit Confirmation".





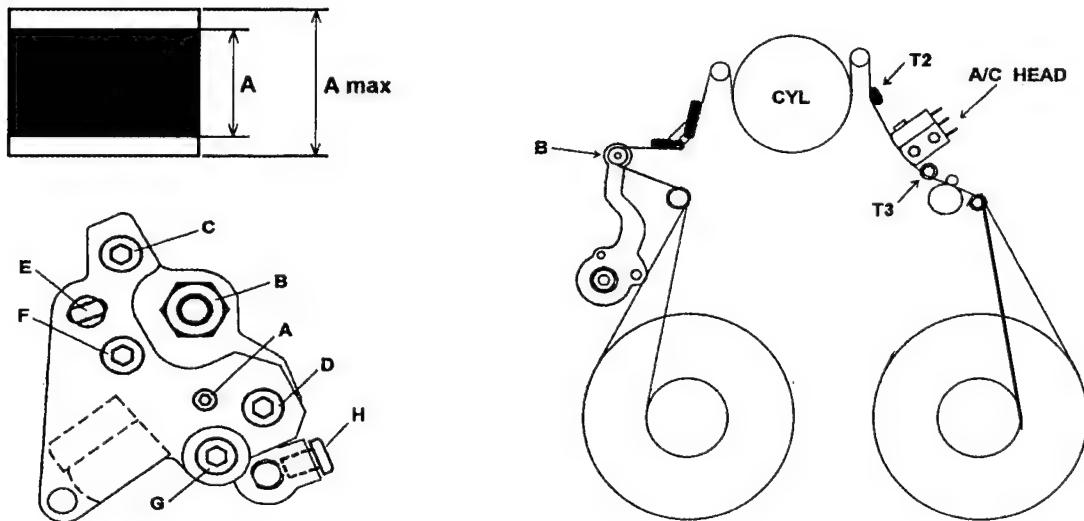
### 3-33. A/C Head Confirmation Procedures



### 3-34. A/C Head Tilt Confirmation

Specification	CUE Output : $A/A_{max} \geq 0.9$
Mode	FWD $\times 1$
Test Point	TP101 : CUE board (H5)
Equipment	Oscilloscope
Adjustment	A/C head Screw A, G
Tool	VFK1178 (Hex Screw 0.89 mm) for Screw A VFK1148 (Hex Screw 1.5 mm) for Screw G
Tape	NTSC: VFM3580KM (Alignment Tape No.1 14 min.~22 min.) PAL: VFM3680KM (Alignment Tape No.1 14 min.~22 min.)

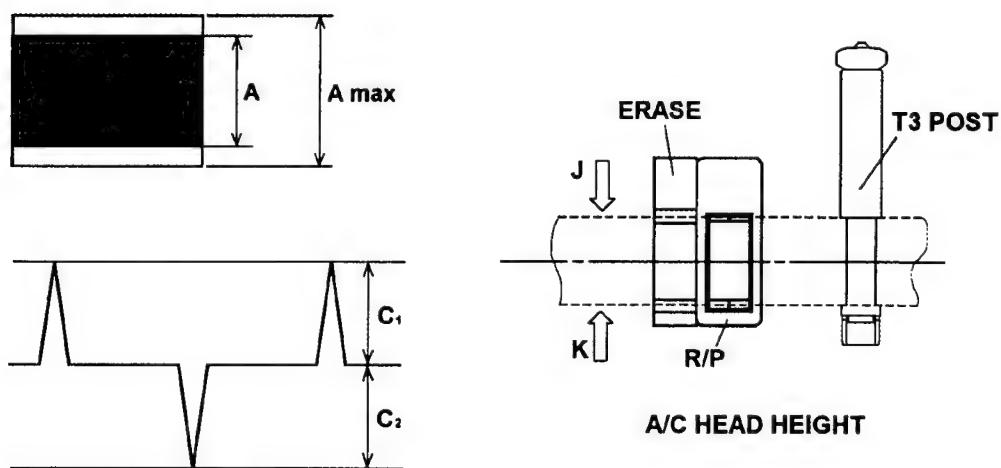
1. Playback the Alignment tape CUE 6 KHz part.
2. Confirm the screw G and H are not loosen. Then Connect the scope to TP101 to observe the CUE output. Vibrate the tension arm to B direction, and confirm the output level variation is in the specification.
3. When complete the adjustment, final screw rotate direction must be tighten direction, and confirm the Screw A is not loosen.
4. When adjust the screw A, loosen screw G and adjust screw A, then tighten screw G.
5. The A/C Head Tilt adjustment effects the T3 post limitation, so adjust item "Play limitation confirmation" again.



### 3-35. A/C Head Height Confirmation

Specification	CUE Output :A = A max CTL Output : C1, C2 $\geq$ 1.8(V)
Mode	FWD $\times$ 1
Test Point	TP101 : CUE BOARD (H5) TP30 : CTL. Servo BOARD (F1)
Equipment	Oscilloscope
Adjustment	A/C head Screw B, H
Tool	VFK1150 (Box Driver 5.5 mm) for Screw B VFK1190 (L type Hex Screw 1.5 mm) for Screw H
Tape	NTSC: VFM3580KM (Alignment Tape No.1 14 min.~22 min.) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

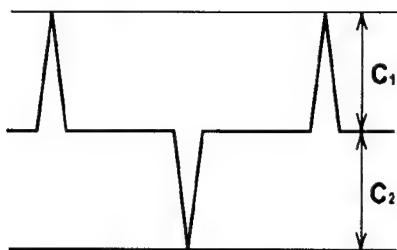
1. Playback the Alignment tape CUE 6 KHz part.
2. Connect the scope to TP101 on CUE board and confirm the CUE output level is not increased even the tape is moved j and k arrow direction.
3. When A/C Head Height is changed, the A/C Head Azimuth is changed also, so adjust and confirm alternately A/C Head Azimuth and A/C Head height.
4. The A/C Head tilt is changed by tightening the screw H, so the confirmation of specification must be done after tightening the screw H.



### 3-36. A/C Head Self Recording Level Confirmation

Specification	CTL Output Level FWD $\times 1$ : C1, C2 $\geq$ 1.8 V REV (-1 $\times$ ) : C1, C2 $\geq$ 1.4 V REV (-0.2 $\times$ ) : C1, C2 $\geq$ 1.2 V
Mode	FWD $\times 1$ REV ( $\times -1$ , $\times -0.2$ )
Test Point	TP30: CTL Output (Servo board : F1)
Equipment	Oscilloscope
Tape	Work Tape for Rec and Play

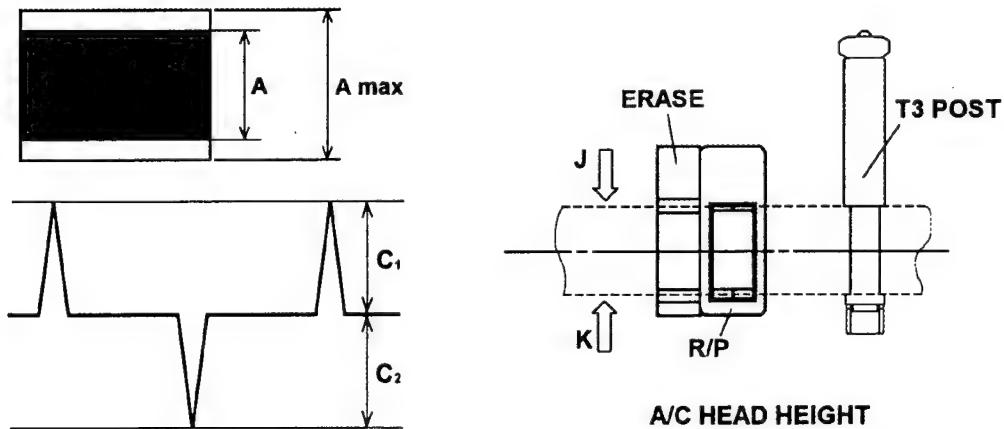
1. Record and Playback by a work tape.
2. Connect the scope to TP30 and confirm the CTL level is in the specification
3. This confirmation should be done after the screws are fixed.
4. If it is not adjust "A/C Head Height" again.



### 3-37. A/C Head Azimuth Confirmation

Specification	CUE Output : A = Amax CTL Output : C1,C2 $\geq$ 1.8(V)
Mode	FWD $\times$ 1
Test Point	TP101: CUE BOARD (H5) TP30 : CTL. Servo BOARD (F1)
Equipment	Oscilloscope
Adjustment	—
Tool	—
Tape	NTSC: VFM3580KM (Alignment Tape No.1 14 min.~22 min.) PAL: VFM3680KM (Alignment Tape No.1 Color Bar Portion)

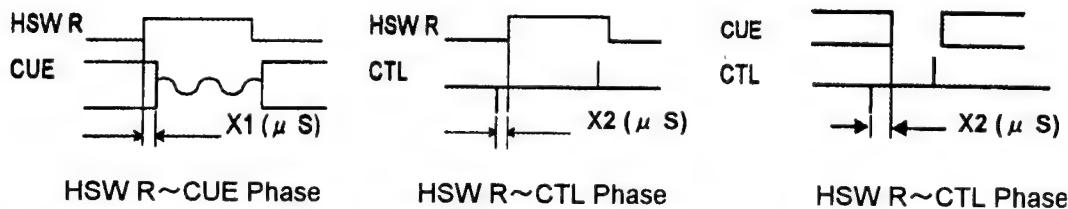
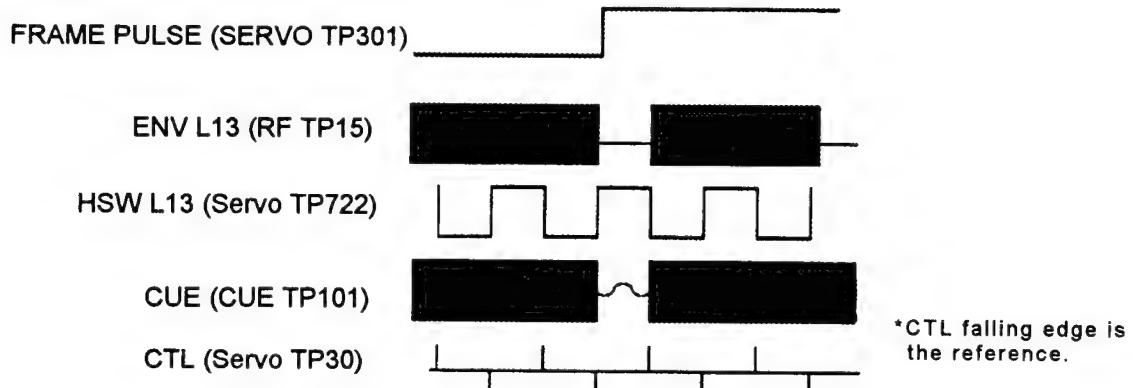
1. Playback the Alignment tape CUE 6 KHz part.
2. Connect the scope to TP101 on CUE board and confirm the CUE output level is not increased even the tape is moved to j and k arrow direction.
3. If the output level is increased, adjust "Tape Pass Adjustment procedures" again.



### 3-38. A/C Head Horizontal Position Adjustment

Specification	As shown in the below figure. $-63 \mu S \leq X1 \leq 63 \mu S$
Mode	ATF control, PLAY mode
Test Point	TP15 :R/P Envelope (RF board : H4) TP722 : HSW_R(Servo board : F1) TP101 : CUE Output(CUE board : H2) TP30 :CTL Output(Servo BOARD : F1)
Equipment	Oscilloscope
Adjustment	A/C Head each screws
Tool	VFK0357(Eccentric driver), Hex driver
Tape	NTSC: VFM3582KM (X Value Master Tape) PAL: VFM3682KM (X Value Master Tape)

1. Adjust A/C Head Azimuth so that the CTL and Lack part of CUE is match in the phase.
2. Confirm the R/P envelope lack track, and select the HSW correspond with it. ( The lack track is corresponded HSW High with L ch.)
3. Adjust CUE phase ( A/C Head Horizontal Position ) so that the selected HSW is match in the phase with the selected HSW.
4. At this time, adjust the phase simultaneously with Azimuth so that the CTL and CUE phase is kept.
5. Confirm the selected HSW, CUE and CTL are match in phase.



Note: If the waveform could not be stabilized by trigger (HSW or CTL) or the scope, please use the TP105 (CF Pulse) on the V OUT P.C. board (F4) for trigger.

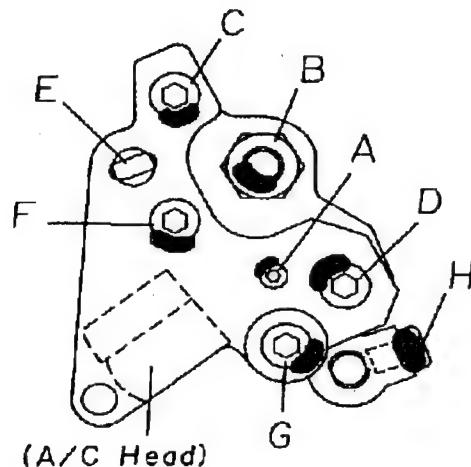
6. After adjustment, access the menu for servo adjustment and select "A09 X VALUE."
7. Play the X Value Master Tape.
8. Keep depressed the JOG/SHTL Selection button until the value disappears momentarily and the renewed value appears. Then release the button. Check that the correction value is within  $0 \pm 55$ . If not, you should make the X Value adjustment again.

### 3-39. A/C Head Screw Lock Tight Grew

	Screw A	Other Screw
Lock Tight Grew Quantity	1/3 of the screw	1/3 of the screw

1. Fix the screws by Lock Tight Grew after adjustment.

2. Before adjustment, melt the grew.

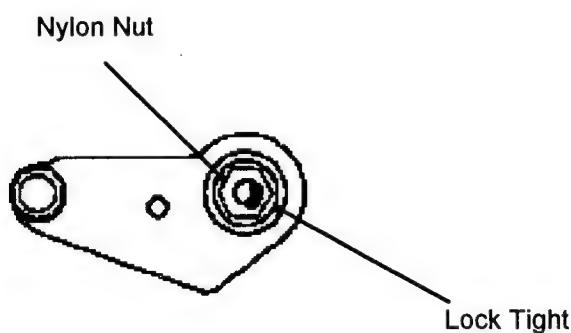


### 3-40. T3 Post, T4 Post Lock Tight Grew

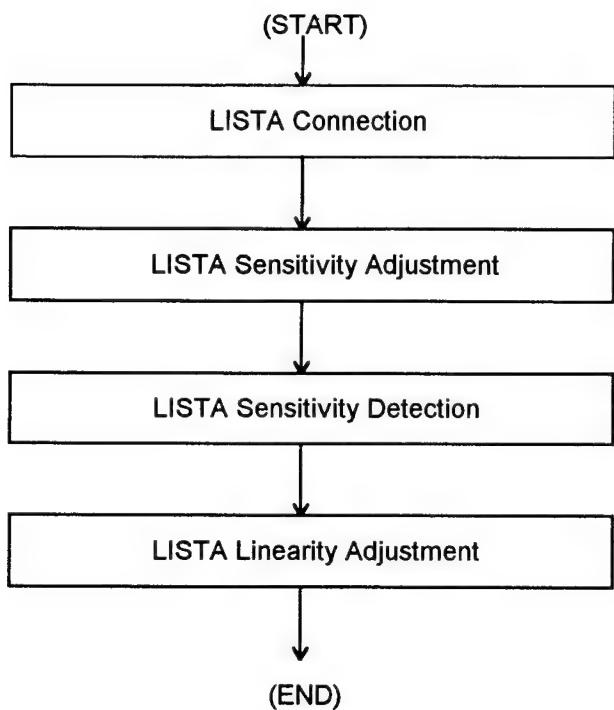
	T3 Post	T4 Post
Lock Tight Grew quantity	1/4 of the screw	1/4 of the screw

1. After adjustment, attach the lock tight grew at the nylon nut.

2. Before adjustment, melt the grew.



### 3-41. LISTA Adjustment Procedures



### 3-42. LISTA Connection

1. Install the LISTA execute file for the AJ-DE77 in the PC's hard disk.

**<How to install>**

Copy the execute file named "LISTA4X. EXE" stored in the VFK1420 into the appropriate directory in which the AJ-D750/D700 LISTA software (VFK1159) has been installed (for example, C:\LISTA).

2. Connect the LISTA cable to the A/D Board installed in the PC.
3. Connect the Flip of the LISTA cable to the TPs on the Servo P.C.B.

(L13)

ATF: TP732

HSW: TP722

GND: TG510

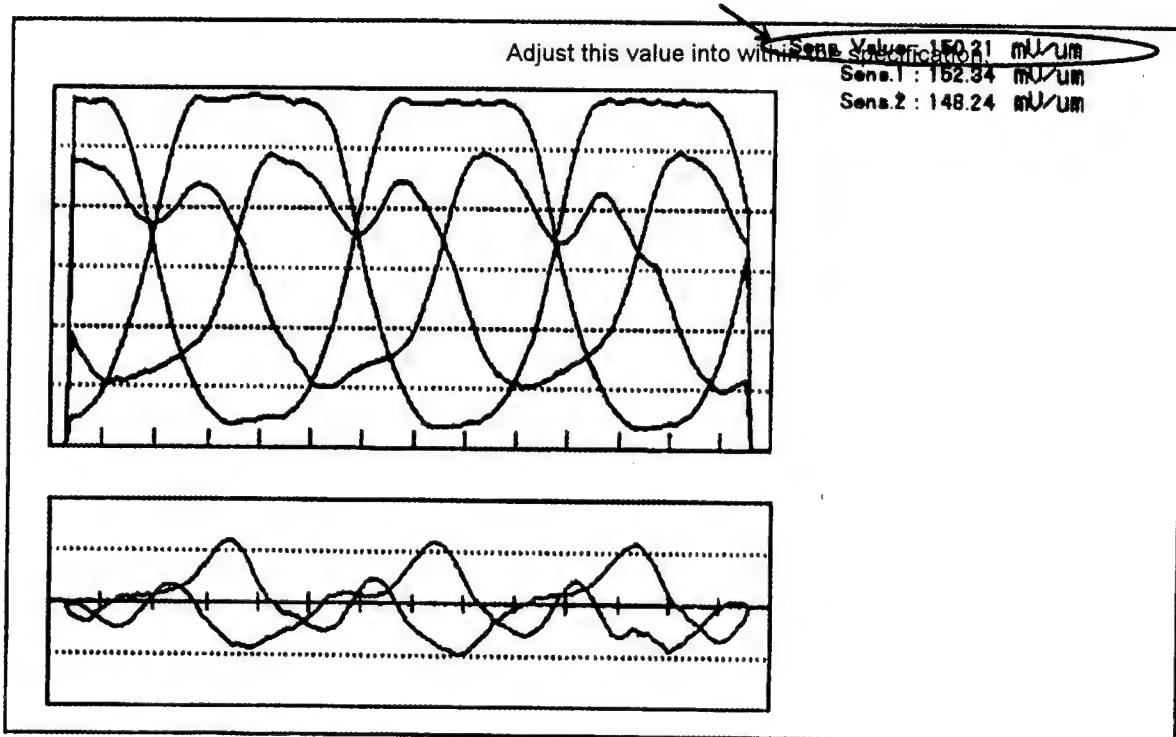
4. Type "LISTA4X" for starting the software. If you press the <ENTER> key, LISTA starts.
5. If the screen for selection of the appropriate machine type appears, select "AJ-DE77" item.
6. Next, if the screen for selection of the linear master tape appears, select the data of the tape to be used, and press the <Y> key to go to the main menu

### 3-43. LISTA Sensitivity Adjustment

Specification	Sensitivity $150 \pm 15(\text{mV}/\mu\text{m})$
Mode	Servo Adjustment Menu: "A04 LR GAIN P"
Test Point	TP732 : ATF_ERR_L13 (Servo BOARD : F1) TP722 : HSW_L13 (Servo BOARD : F1) TG510 : GND (Servo BOARD : F1)
Equipment	LISTA Set
Adjustment	ATF Gain (Select by JogDial)
Tape	NTSC: VFM3581KM (Alignment tape No.2 LISTA master) PAL: VFM3681KM (Alignment tape No.2 LISTA master)

1. Display the Servo menu, and select "A04 LR GAIN P".
2. Playback the LISTA Master Tape.
3. Select the LISTA Menu " (6) ATF Error Signal Monitor " and display the sensitivity data in real time.
4. When the sensitivity data is displayed, adjust ATF Gain so that the sensitivity value at right-up on the monitor.
5. After Adjustment, press ESC key and exit to the menu mode.

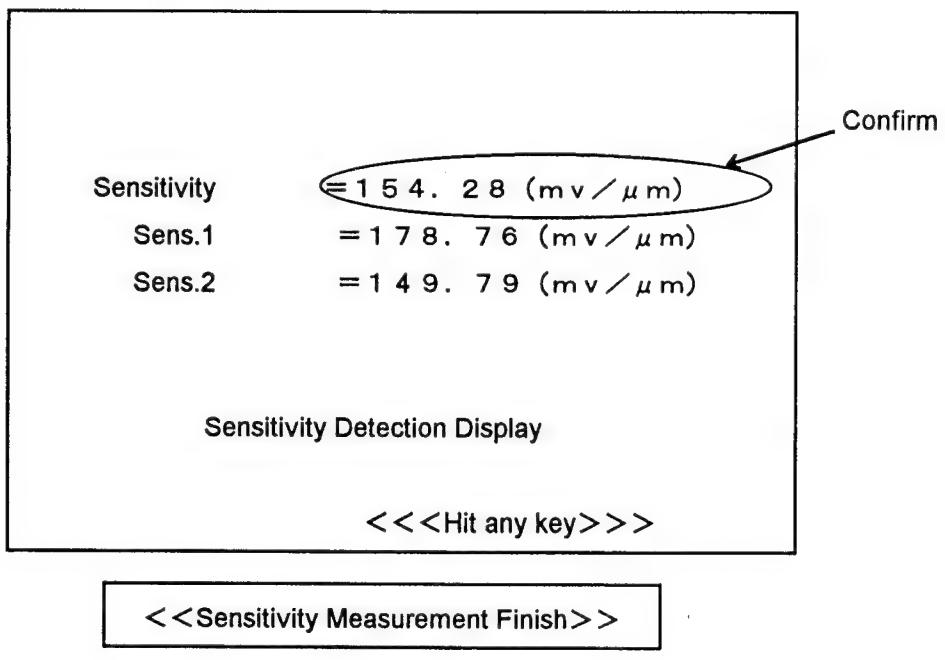
※ ATF Gain is adjusted by rotating the JOG dial while pressing the JOG/SHTL key.



### 3-44. LISTA Sensitivity Detection

Specification	Sensitivity $150 \pm 15 (\text{mV}/\mu\text{m})$
Mode	Servo Adjustment Menu :"A04 LR GAIN P"
Test Point	TP732 : ATF_ERR_L13 (Servo BOARD : F1) TP722 : HSW_L13 (Servo BOARD : F1) TG510 : GND (Servo BOARD : F1)
Equipment	LISTA Set
Tape	NTSC: VFM3581KM (Alignment tape No.2 LISTA master) PAL: VFM3681KM (Alignment tape No.2 LISTA master)

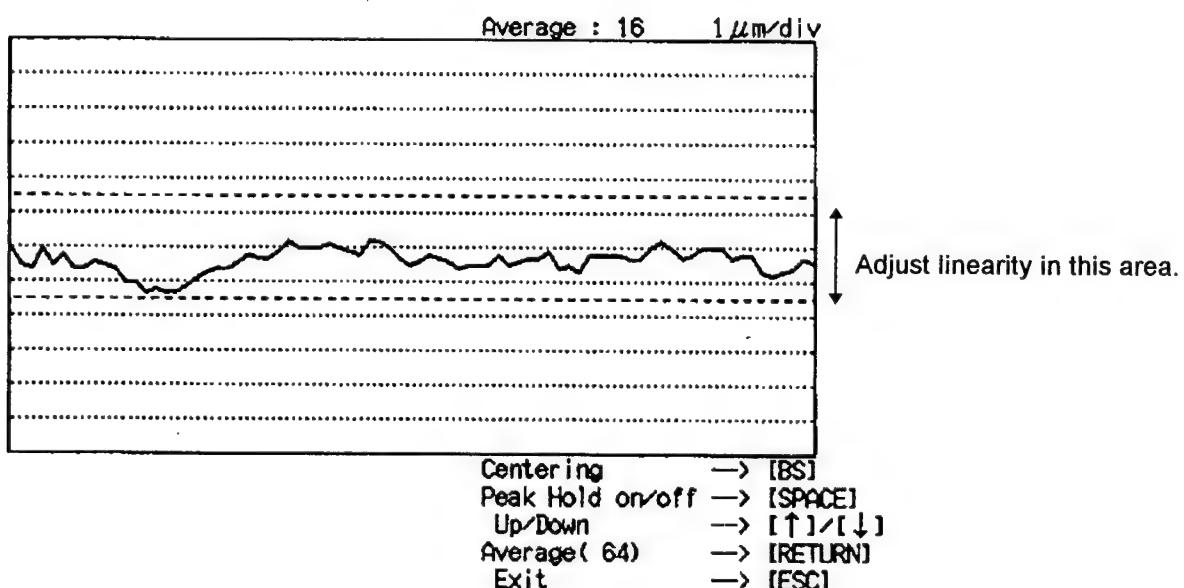
1. Display the Servo menu and select "A04 LR GAIN P".
2. Playback the LISTA Master Tape
  - Item 1 and 2 can be omitted after "LISTA Sensitivity Adjustment (R/P)"
3. Select the [(1) Sensitivity Measurement] and start Sensitivity Detection.
4. When the sensitivity is displayed, confirm the sensitivity is in the specification.
5. If it is out of specification, repeat the "LISTA Sensitivity Adjustment (R/P)".



### 3-45. LISTA Linearity Adjustment

Specification	Linearity: Less than 3 $\mu$ m
Mode	Servo Adjustment Menu : "A05 LINEAR P"
Test Point	TP732 : ATF_ERR_L13 (Servo BOARD : F1) TP722 : HSW_L13 (Servo BOARD : F1) TG510 : GND (Servo BOARD : F1)
Equipment	LISTA Set
Tool	VFK1149(Post driver)
Adjustment	S1, T1 Post Height
Tape	NTSC: VFM3581KM (Alignment tape No.2 LISTA master) PAL: VFM3681KM (Alignment tape No.2 LISTA master)

1. Display the Servo menu and select the "A05 LINEAR P".
2. Playback the LISTA master tape.
3. Select the (2) Linearity Measurement on the LISTA menu, and display the linearity.
4. When linearity is displayed, adjust S1 and T1 post so that the linearity is in the specification.
  - Lower part of the monitor shows the lead.
  - Adjust the waveform is in the red dot lines.
  - Linearity is displayed in not Play mode, so adjust it while item envelope waveform confirmation.
5. Adjustment is done while observing the oscilloscope, adjust the post height so that the envelope is correct.



### **3-46. LISTA Data Saving**

1. This item is done after Peak hold function of item "3-45. LISTA Linearity Adjustment".
2. Select the " (3) Data Save / Load " of LISTA menu and select " <1> Save ".
3. When waving measurement result is displayed, save the data.
4. Confirm the data is saved.

## 4. MAJOR MECHANISM PARTS REPLACEMENT AND ADJUSTMENT PROCEDURE

### GENERAL

When mechanical parts are replaced, pay attention to the following notes.

1. Always turn power off before replacing any parts.
2. If any adjustment is necessary after the parts is replaced, perform the adjustment after replacement.
3. Use proper hard tools of fixtures.
4. Be sure to clean the parts after replacement, Also when the mechanical parts are replaced, follow the replacement procedure.

### 4 -1 Cylinder Unit Replacement

1. Refer to the Mechanism replacement in the Disassembly procedures.
2. Remove the Bottom Panel of the Mechanism Unit.
3. Unscrew the 2 screws and remove the T1 GUIDE (Refer to item 4-1-1).
4. Remove the cleaning Arm Unit (Refer to item 4-1-1).
5. Disconnect the connector P2 and P3 on the Head Buffer 1 P.C.Board. And remove the screw which is fixed with the flexible cable.

**Note:** Be careful that remove the flexible cable from the connector for flexible cable. Please refer to how remove the connector as shown in below.

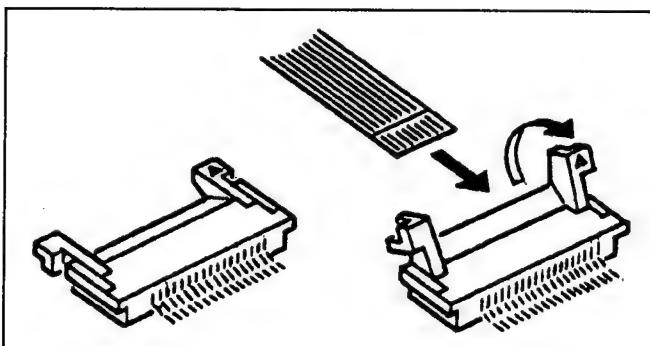


Fig. 4-1A

6. Disconnect the connector P33 the Mech Interface P.C.Board. And remove the 3 screws which have spring from the Cylinder Unit, then remove the Cylinder Unit without touching any mechanical parts.

**Note:** Never touch the cylinder by finger directly, when pull out the Cylinder Unit.

#### <Installation>

1. Install the new Cylinder Unit the previous steps in reverse order.

**Note:** When install the Cylinder Unit, the pin on Mech chassis should be match to hole of Cylinder Unit as shown in Figure 4-1B.

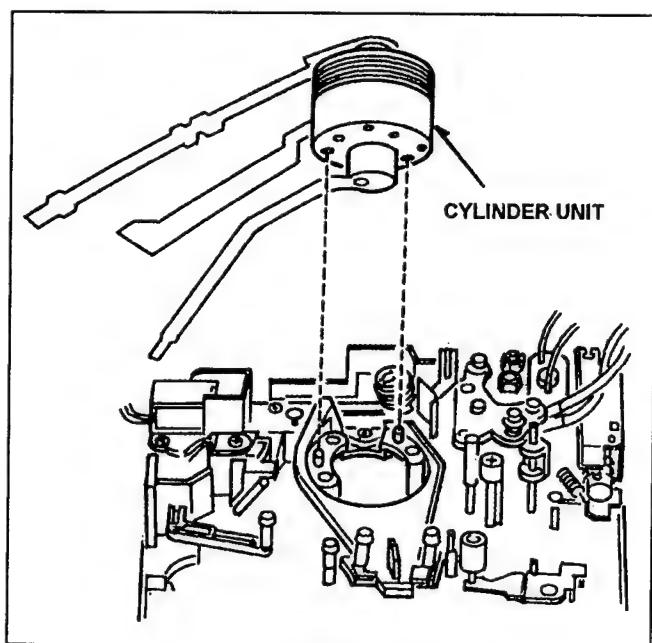


Fig. 4-1B

2. After installation of T1 Guide, T1 Guide position adjustment should be performed (See "Cleaning Arm Unit Replacement" and "T1 Guide Position Adjustment").

#### 4-1-1. Cleaning Arm Unit Replacement

##### <Removal>

1. Unscrew the 2 screws (A) and remove the T1 Guide.
2. Hang off the tip portion (B) of cleaning Arm Unit and hang off the spring from Cleaner Arm Unit, then remove the Cleaning Arm Unit as shown in Figure 4-1-1.

##### <Installation>

1. Install the Cleaning Arm Unit, then hang on the spring to Cleaning Arm Unit.
2. Install the T1 Guide by tightening 2 screws (A).
3. Press the iron core of the Cleaner Solenoid and confirm that the Cleaner Roller is rotated, when the cylinder is rotated by hand.
4. T1 Guide position adjustment should be performed as follows.

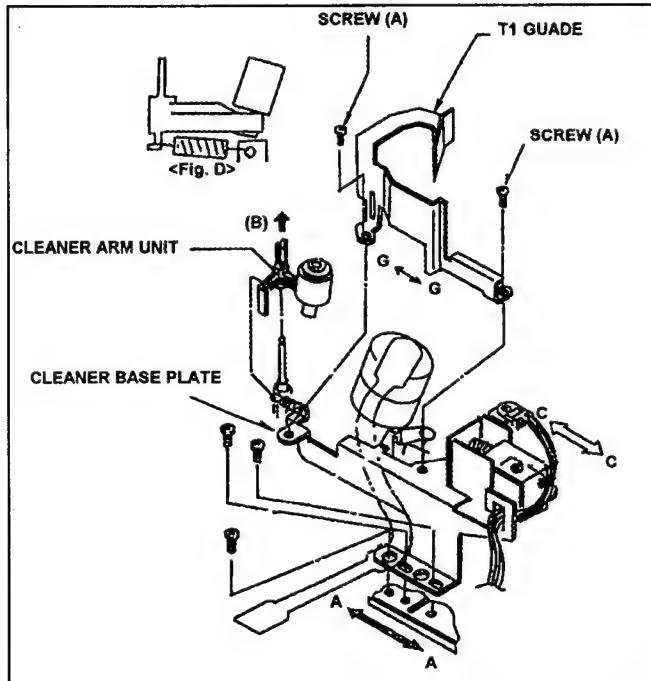


Fig. 4-1-1

#### 4-1-2. T1 Guide Position Adjustment

1. Place the Loading completed position.

##### <How to making the Loading Condition>

- Open the "Servo Adjust" menu in the Service Menu.
- Select the item "T TORQUE" and press the search button for making the loading condition and turn power to off.

2. Observe the clearance (B) between T1 Guide and T1 post as shown in Figure 4-1-2. And make sure that it is within 0.2 to 0.5mm.
3. If not, loosen the 2 screws (A) and adjust the position of T1 Guide by moving arrow direction (G ↔ G) so that the clearance (B) is within specification. And tighten the 2 screws (A).

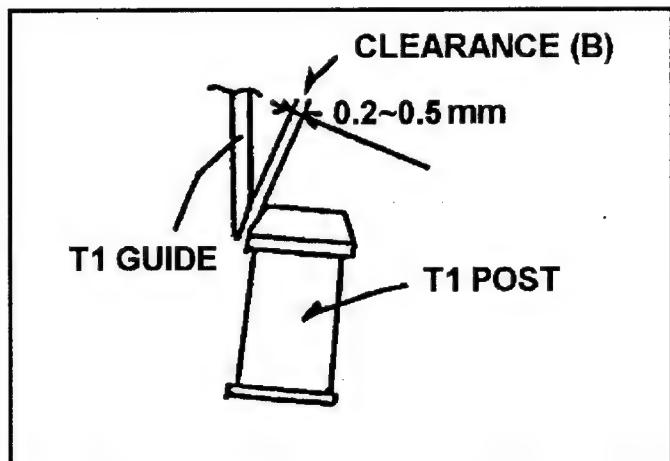
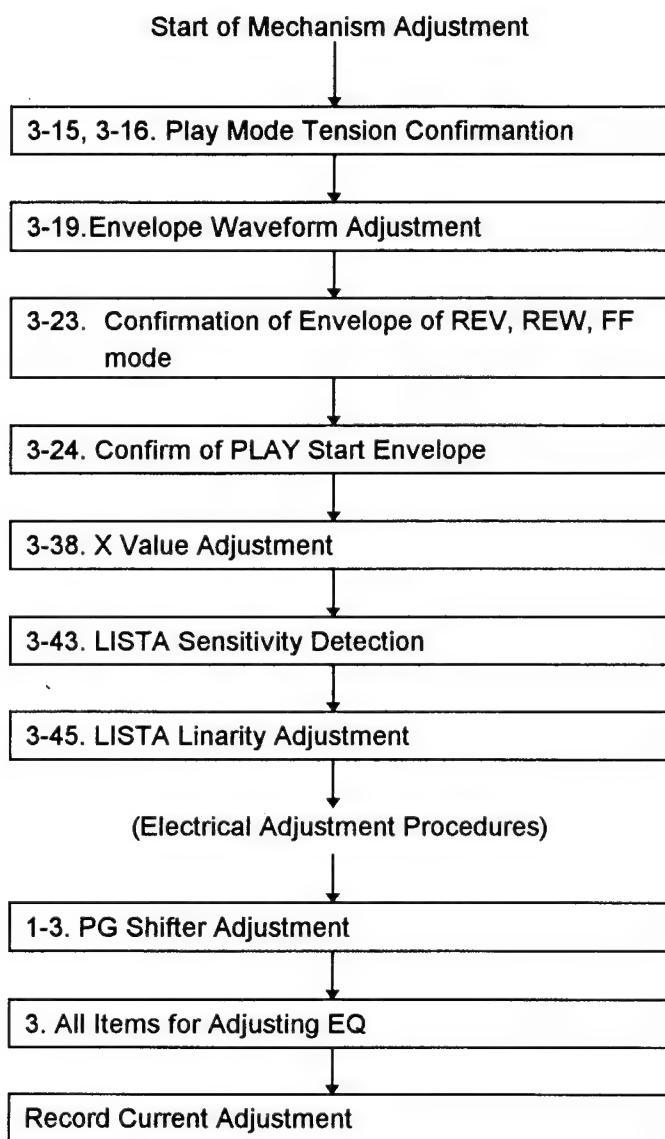


Fig. 4-1-2

#### 4-1-3. Adjustment Flowchart After Cylinder Unit Replacement

1. Use the following procedures in the flow chart to make adjustments after the cylinder unit is replaced.



## 4-2. A/C Head Replacement

### 4-2-1. Replacement

※ Tools required:

Nut Driver (5.5m/m)(VFK1150)  
Hex Driver (VFK1148)  
Hex Wrench (VFK1190)

#### <Removal>

1. Remove the Mechanical Unit (Refer to item [2-1. Removal of Mechanical Unit]).
2. Loosen the hex screw (B) and remove the Nut (C). Hang off the Head Height Adjustment Spring and then remove the A/C Head Unit as shown in Figure 4-2-1.

**Point:** Memorized height of Nut (C) before remove the Nut (C).

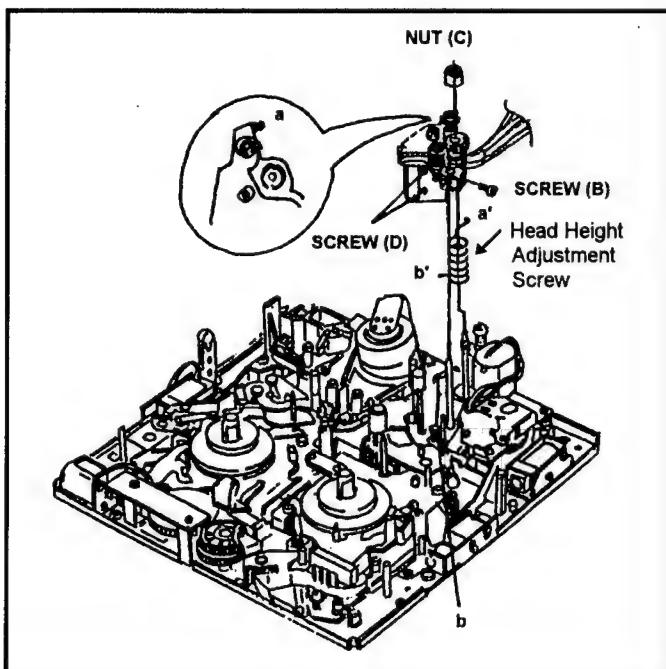


Fig. 4-2-1

3. Remove the 2 screws (A) and disconnect the connector P1 on the A/C Head I/F and P30 on the Mech I/F P.C. Board, then remove the A/C Head from the A/C Head Plate.
4. Remove the Shield Cover by removing 2 screws (D) as shown in Figure 4-2-1.
5. Unsolder the lead wires (When unsolder the lead wires, do not unsolder all at the same time).

**Note:** When unsolder the lead wires, do not unsolder all at the same time

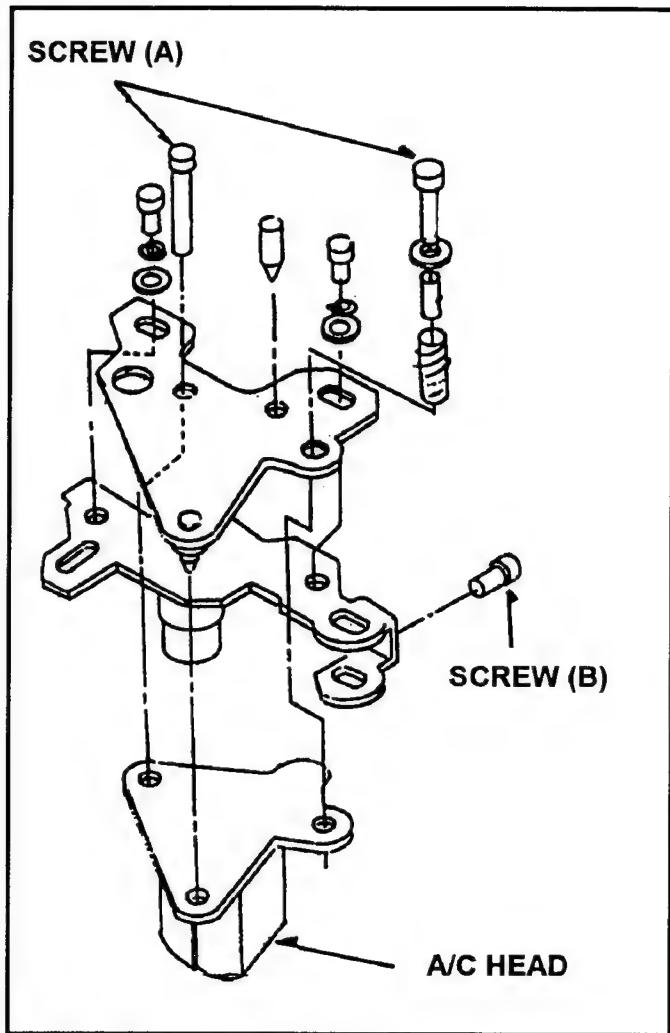


Fig. 4-2-2

#### <Installation>

1. Remove the Shield Case from the New A/C Head and solder the lead wires to New A/C Head (Refer to Figure 4-2-3).
2. Reinstall the shield case to A/C Head.
3. Install the A/C Head to A/C Head Plate by tight 2 screws (A), then set to parallel the gap between A/C Head and A/C Head Plate.
4. Install the A/C Head Unit.
5. Hang on the Head Height Adjustment Spring and tighten the Nut (C).
6. Clean the surface of the A/C Head.

**Note:** After installation, Mechanical and Electrical adjustments should be performed and the hex screw (B) is kept loose until finish the A/C Head Height Adjustment.

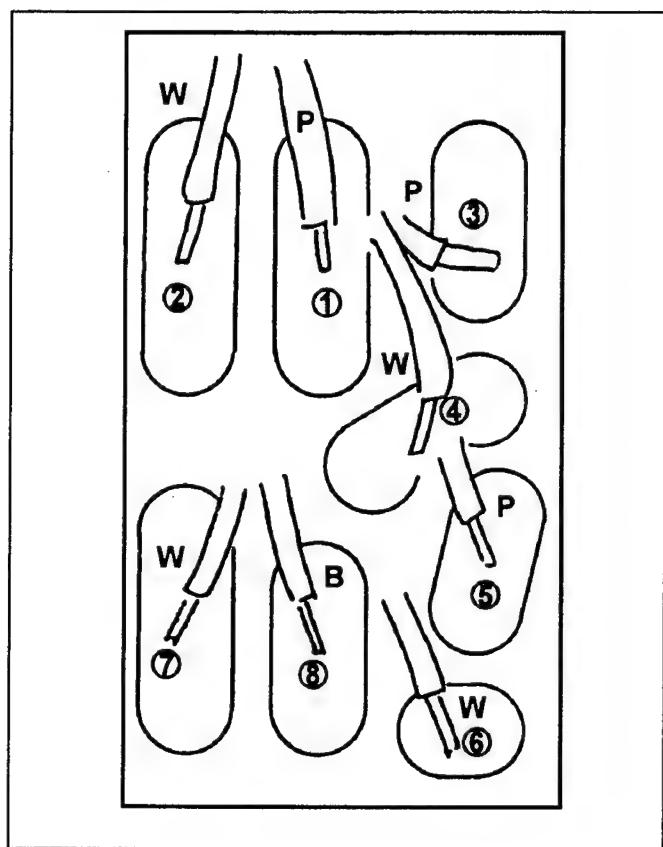
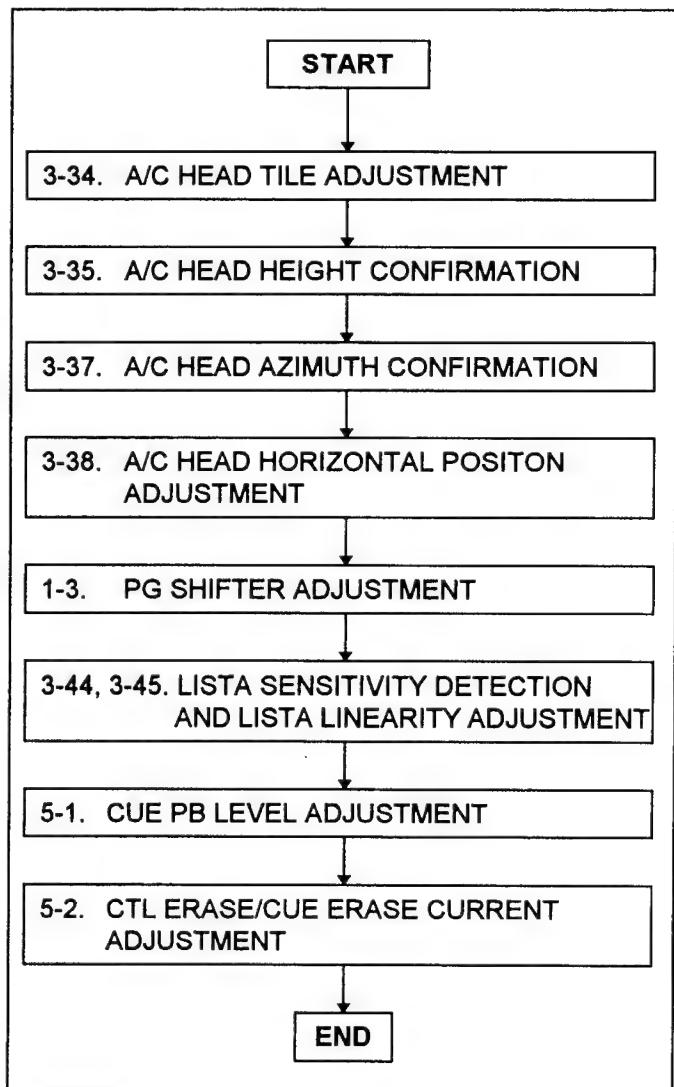


Fig. 4-2-3 Connection of A/C Head

A/C Head Side	Cable Color	Connector No.
1	PINK	P1
2	WHITE	
3	PINK	
4	WHITE	
5	PINK	
6	WHITE	
7	WHITE	
8	BLACK	

#### 4-2-2. A/C Head Adjustment Flowchart

1. After change the A/C Head, please perform the following steps.



### 4-3. Supply and Take up Reel Table Replacement

#### <Removal>

1. Remove the Mechanical Unit (Refer to item [2-1. Removal of Mechanical Unit]).
2. Press the iron core of Brake Solenoid to release the Reel Brake.
3. Pull out the supply and Take up Reel Table. (Be careful when pull out or install the Reel Table. Because the some damage are appeared to bearing in the Reel Table by it.)

#### <Installation>

1. Install the Reel Tables following previous steps in reverse order.
2. After Installation, Main Brake torque confirmation (Refer to item 3-3) should be performed as follows.

**Note:** Memorized the groove position of Reel Base, which inserted the pin of Drive Arm Unit.

#### <Installation>

1. Through in the Reel Outer Rail to New Supply and Take Up Reel Rotor Unit.
2. Hang on the Reel Rotor Unit to Reel Inner Rail and Install the Reel Rotor Unit then the pin of Drive Arm Unit should be matched with groove position of Reel Base as shown in Figure 4-4-3.
3. Install the 4 screws (C), (D) and (E).
4. Confirm that the Reel Rotor Unit moving smoothly on the Rail by hand.
5. Move the Reel Rotor Unit to front side by hand and then pull up the iron core of M stopper solenoid for operating M stopper.
6. Set the unloading condition by turn the Emergency shaft counter-clockwise.
7. Confirm the Main Brake Torque (Refer to item 3-3).
8. Connect the Flexible Cable to Connector P34 and P35 on the Mech I/F P.C. Board.
9. Adjust the Motor Torque Offset value (Refer to item 1-1 of section 4).
10. Confirm that the Tension value on playback mode (Refer to items 3-15, 3-16).

### 4-4. Supply and Take Up Reel Rotor Unit Replacement

#### <Removal>

1. Remove the Mechanical Unit (Refer to item [2-1. Removal of Mechanical Unit]).
2. Disconnect the connector P34 and P35 on the Mech I/F P.C. Board as shown in Figure 4-4-2.
3. Move the S1 post to loading direction by manual ejecting method until the screw (C) can removing position.
4. Confirm the supply and Take Up Brake are not release.
5. Press the iron core of M stopper solenoid to release the M stopper.
6. Remove the 4 screws (C), (D) and (E) as shown in Figure 4-4-1.
7. Remove the Supply and Take Up Reel Rotor Unit and Reel Outer Rail.

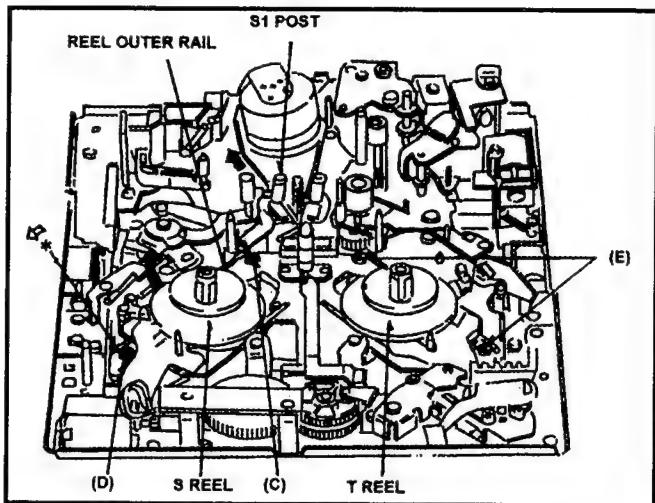


Fig. 4-4-1 Removal of S & T Reel Rotor Unit

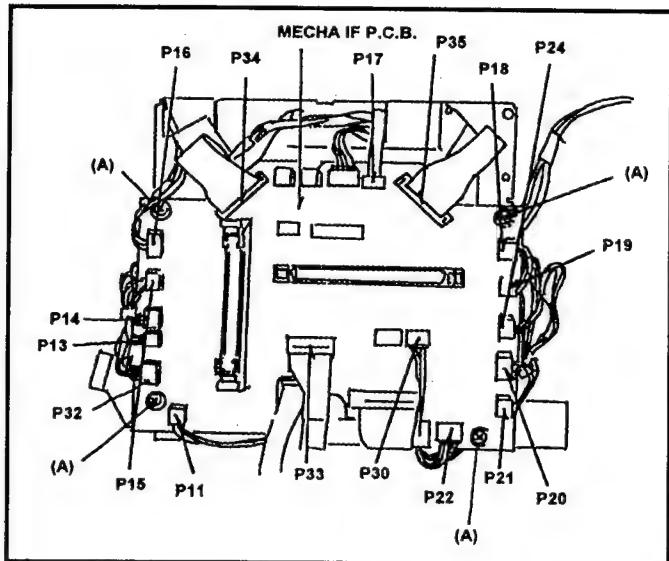


Fig. 4-4-2 Connection of Mech I/F P.C. Board

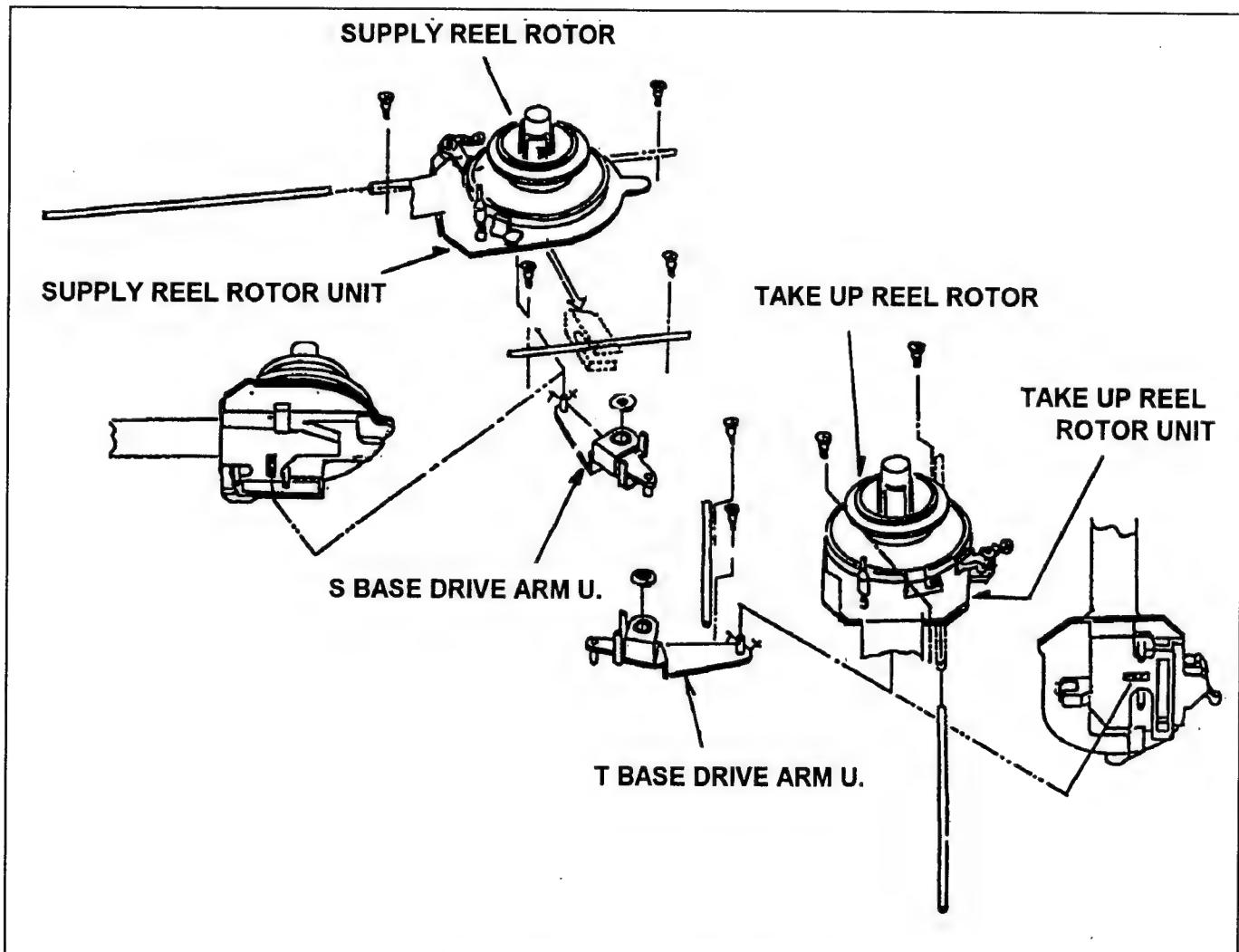


Fig. 4-4-3 Install of S & R Reel Rotor Unit

## 4-5. Loading Motor Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P21 on Mech I/F P.C.Board as shown in Figure 4-4-2.
3. Remove the Pinch Solenoid Unit (Refer to item 4-8).
4. Unscrew the screw (B), and remove the Emergency Shaft as shown in Figure 4-5-1.
5. Unscrew the 2 screws (C) and remove the Loading Motor Neutral Unit as shown in Figure 4-5-1.
6. Unscrew the 2 screws (D) and remove the Loading Motor Unit as shown in Figure 4-5-1.

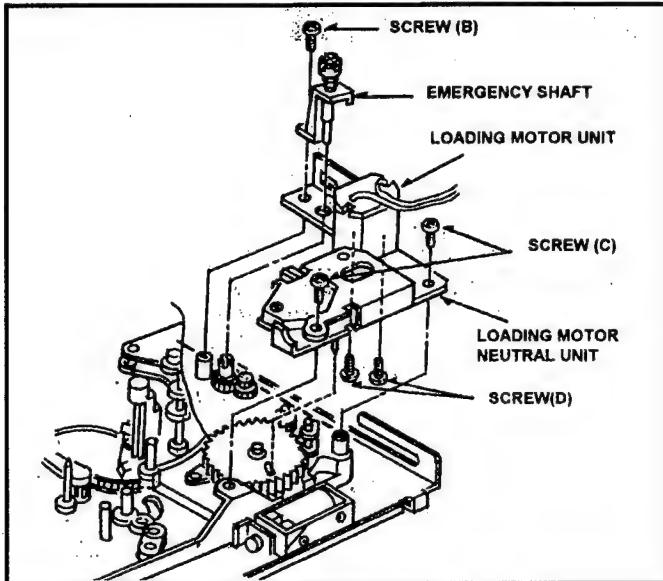


Fig. 4-5-1 Removal of Motor Unit

### <Installation>

1. Install the new Loading Motor Unit to Loading Motor Neutral Unit by tightening 2 screws (D).
2. Install the Loading Motor Neutral Unit by tightening the 2 screws (C), then be careful that the pin of Mode SW Unit should be matched to groove position of main Cam Gear.
3. Install the Emergency Shaft by tightening the screw (B).
4. Install the Pinch Solenoid Unit and after installation it, Pinch Solenoid Position adjustment is required. (Refer to item 3-2).

## 4-6. Pinch Arm Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P20 on the Mech I/F P.C.Board as shown in Figure 4-4-2.
3. Remove the Pinch Solenoid Unit (Refer to item 4-8), then hang off the Pinch Solenoid Lever as shown in Figure 4-6-1.
4. Remove the cut washer (A) and remove the Pinch Solenoid Lever as shown in Figure 4-6-1.
5. Remove the cut washer (B) and remove the Pinch Arm Unit as shown in Figure 4-6-1.

### <Installation>

1. Install the new Pinch Arm Unit follow the removal steps in reverse order then Pinch Solenoid Position Adjustment is necessary (Refer to item 3-2).

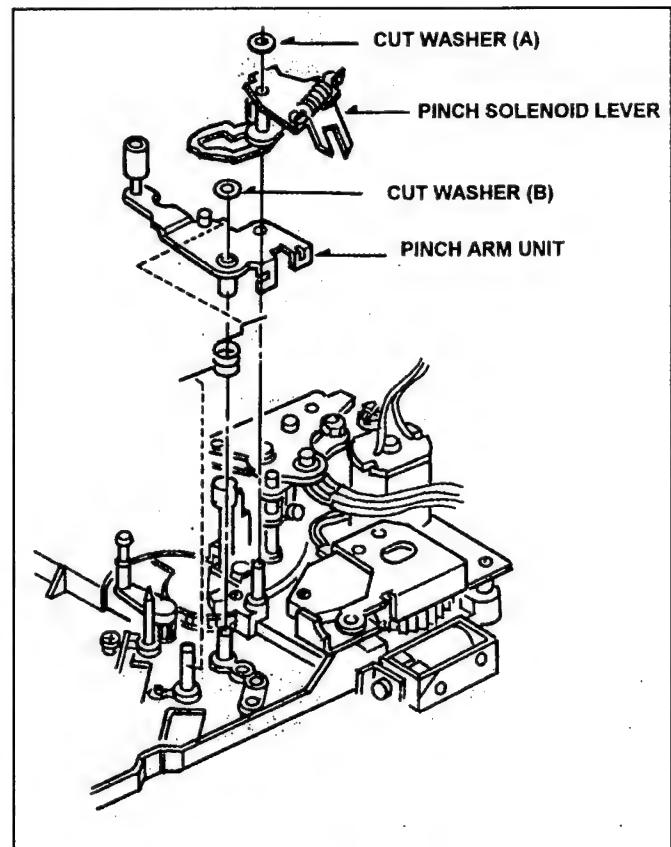


Fig. 4-6-1 Removal of Pinch Arm Unit

## 4-7. Supply and Take Up Brake Arm Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Press the iron core of Brake Solenoid for release the Brake.
3. Remove the cut washers (A) and remove the supply and Take Up Brake Arm Unit as shown in Figure 4-7-1.

### <Installation>

1. When install the new Brake Arm Unit first, hang on the Brake Arm Spring as shown in Figure 4-7-1.
2. Follow the previous steps in reverse order.
3. Main Brake Torque confirmation is required (Refer to item 3-3).
4. Confirm that the Tension value on the Playback mode (Refer to items 3-15, 3-16).

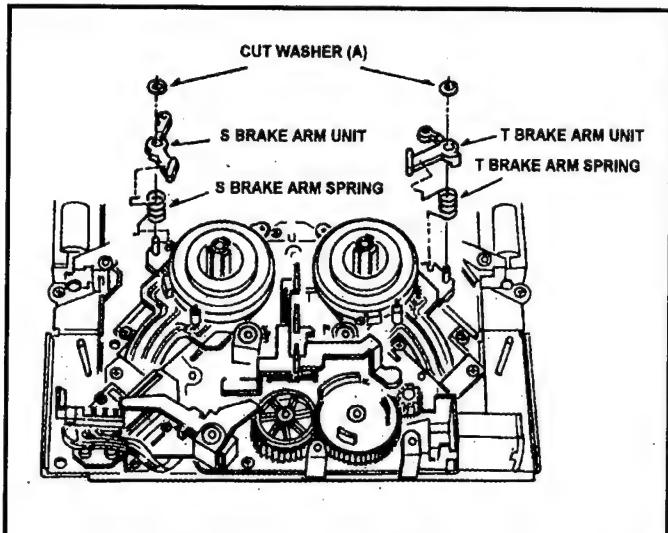


Fig. 4-7-1 Removal of S & T Brake Arm Unit

## 4-8. Mode Select Switch Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P22 on the Mech I/F P.C.Board as shown as Figure 4-4-2.
3. Remove the Pinch Solenoid Unit and Loading Motor Neutral Unit (Refer to item 4-5).
4. Remove the screw (D) and remove the Mode Select Switch Unit from Loading Motor Neutral Unit as shown in Figure 4-8-1.

### <Installation>

1. Install the New Mode Select Switch Unit follow the removal steps in reverse order (Please refer to item [4-5. Loading Motor Unit Replacement]).

**Note:** Be careful the pin of Mode Switch Unit should be matched to groove of Main Cam Gear.

2. After install the Pinch Solenoid Unit, Pinch Solenoid Position adjustment is required (Refer to item 3-2).

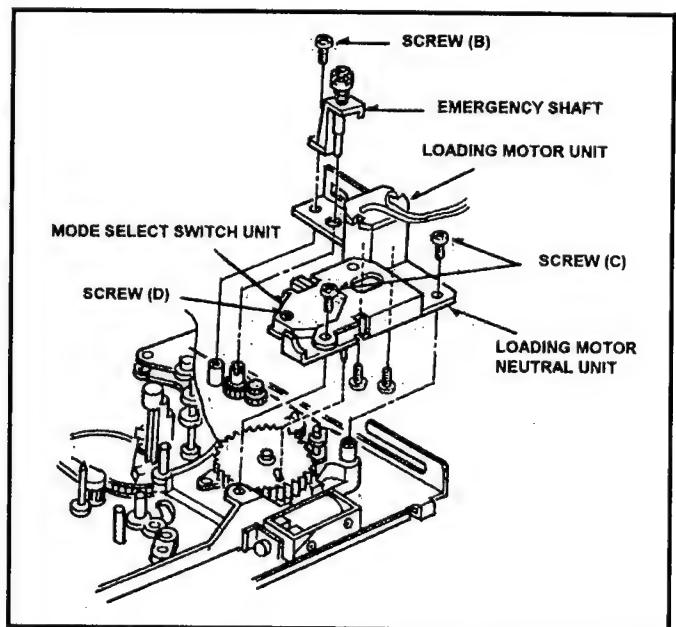


Fig. 4-8-1 Removal of Mode Select Switch Unit

## 4-9. Pinch Solenoid Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Unscrew the 2 screws (A) and remove the Pinch Solenoid Unit as shown in Figure 4-9-1.
3. Unscrew the 2 screws (B) and remove the Pinch Solenoid Angle as shown in Figure 4-9-1.
4. Unscrew the 2 screws (C) and remove the Pinch Solenoid from the Pinch Solenoid Base.

### <Installation>

1. Install the new Pinch Solenoid follow the removal steps in reverse order.
2. After installation, Pinch Solenoid Position Adjustment is required (Refer to item 3-2).

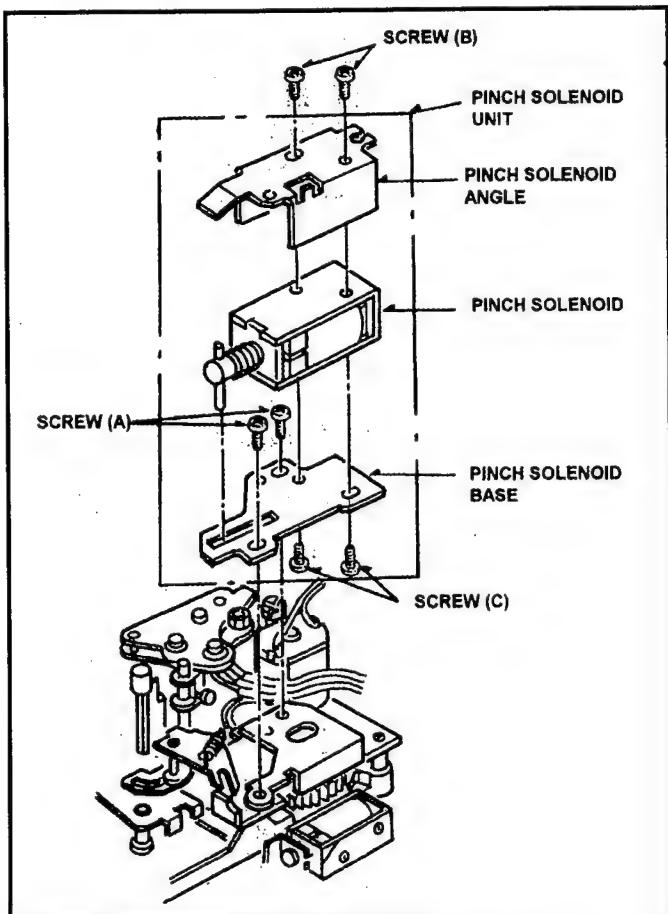


Fig. 4-9-1. Removal of Pinch Solenoid

## 4-10. Supply Brake Solenoid Replacement and Adjustment

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P15 on the Mech I/F P.C.Board.
3. Unscrew the 2 screws (A) and remove the Supply Brake Solenoid Base Unit as shown in Figure 4-10-1.
4. Unscrew the 2 screws (B) and remove the supply Brake Solenoid from Supply Brake Solenoid Base Unit as shown in Figure 4-10-1.

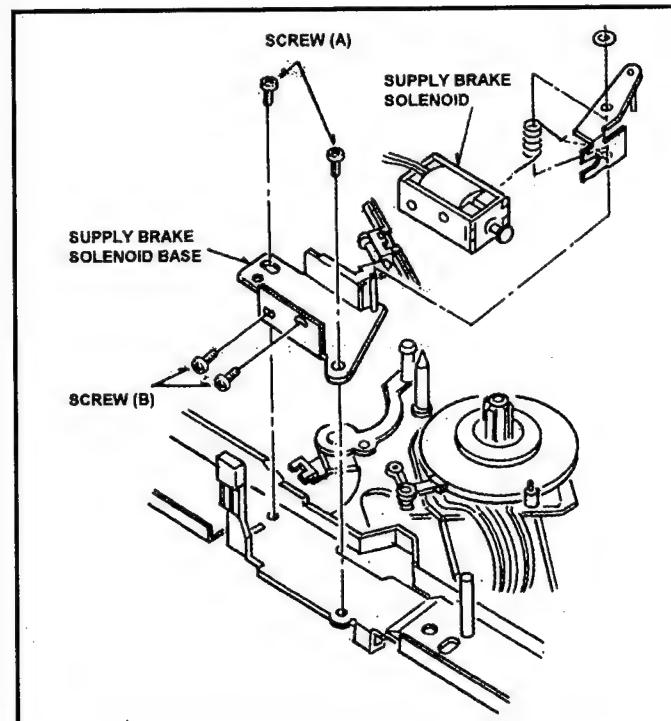


Fig. 4-10-1. Removal of Supply Brake Solenoid

### <Installation>

1. Install the new supply Brake Solenoid follow the removal steps in reverse order.

#### <Adjustment>

1. Place the reels in the M cassette size position.
2. Observe the clearance (A) between Brake pad and it's turntable as shown in Figure 4-10-2. And make sure that it is within 0.2 to 0.5mm.
3. If not, loosen the 2 screws (A), which fixed supply and Take Up Brake Solenoid Unit. And adjust the position of Brake Solenoid Unit by moving arrow direction so that the clearance (A) is within specification. And tighten the 2 screws (A).
4. After adjustment, change the reel position to L cassette size, and confirm that the clearance (A) is within specification.

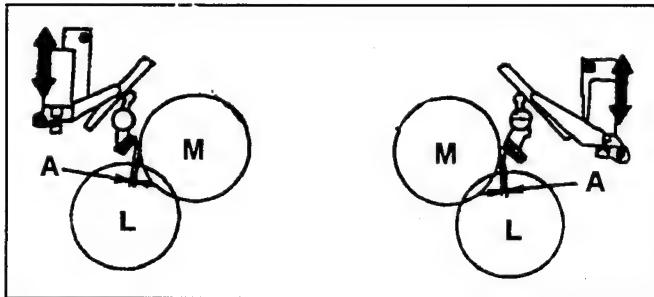


Fig. 4-10-2 Brake Solenoid Adjustment

### 4-11. Take Up Brake Solenoid Replacement and Adjustment

#### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P18 on the Mech I/F P.C.Board.
3. Unscrew the 2 screws (A) and remove the Take Up Brake Solenoid Base Unit as shown in Figure 4-11-1.
4. Unscrew the 2 screws (B) and remove the Take Up Brake Solenoid from Take Up Brake Solenoid Base Unit as shown in Figure 4-11-1.

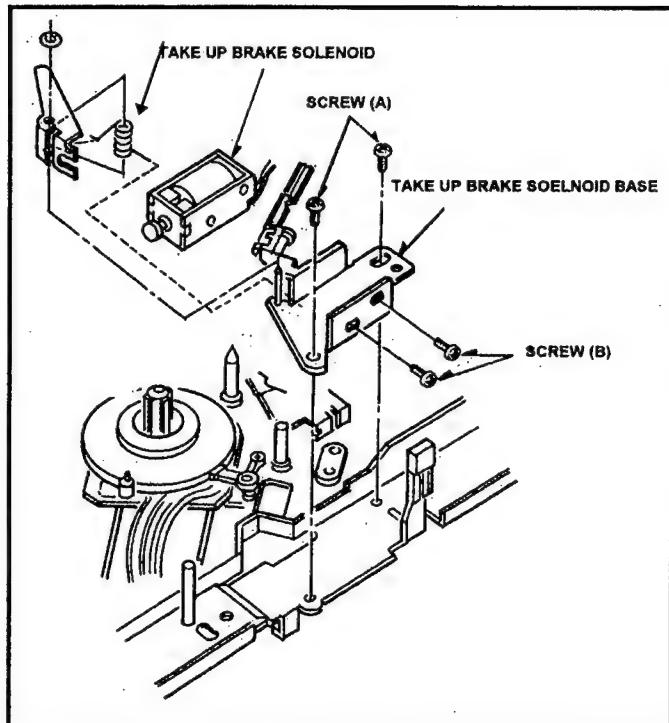


Fig. 4-11-1 Removal of Take Up Brake Solenoid

#### <Installation>

1. Install the new Take up Brake Solenoid follow the removal steps in reverse order.

**Note:** Hang on the Take up Brake Spring as shown in Figure 4-11-1.

2. After installation, position adjustment should be performed as follows.

#### <Adjustment>

1. Please adjust the position of Take up Brake Solenoid Unit follow the adjustment procedure, which is described item 4-11.

## 4-12. MIC Rail Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P17 on Mech I/F P.C.Board.
3. Remove the MIC Drive Rev Spring at MIC Rail Unit side as shown in Figure 4-12-1.
4. Unscrew the 3 screws (A) and remove the MIC Rail Unit as shown in Figure 4-12-1.

### <Installation>

1. Install the new MIC Rail Unit follow the removal steps in reverse order.
2. Confirm that the M and L cassettes touch to MIC Rail Unit correctly.

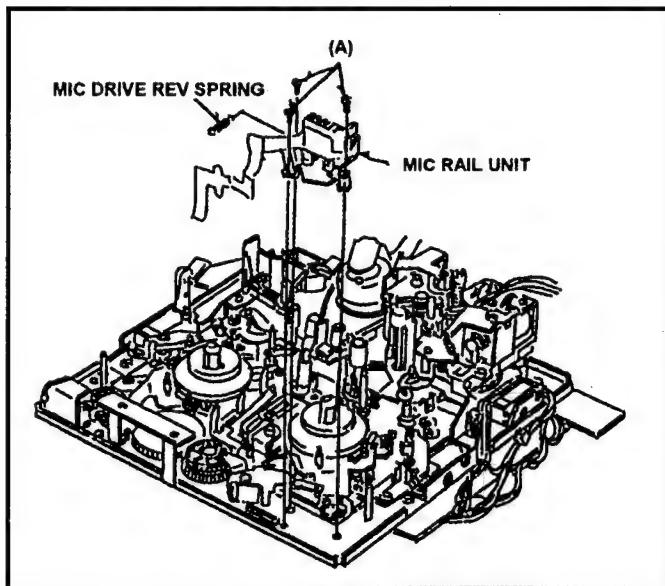


Fig. 4-12-1 Removal of MIC Rail Unit

## 4-13. S1 Post Loading Arm Unit Replacement and Adjustment

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Remove the S5 Post Base Unit (Refer to item 4-17).
3. Unscrew the screw (A) and remove the S1 Post from Loading Rail as shown in Figure 4-13-1.
4. Remove the Cut Washer (B) and remove the S1 Loading Arm Unit as shown in Figure 4-13-1.

### <Installation>

1. Install the new S1 Loading Arm Unit follow the removal steps in reverse order, then S1 Post Loading Arm Unit Phase Adjustment should be performed as follows.
2. After installation, confirm that the S1 Post moving smoothly on the Loading Rail. Tension Arm (Refer to item 3-6), Post Height Pre-Adjustment (Refer to item 3-4) and Linearity Adjustment. (Refer to item 3-17 [Tape Pass Adjustment Procedure]) should be performed.

### (Adjustment)

When install the S1 Post Loading Arm Unit, then the hole (A) should be matched hole (B) as shown in Figure 4-13-1.

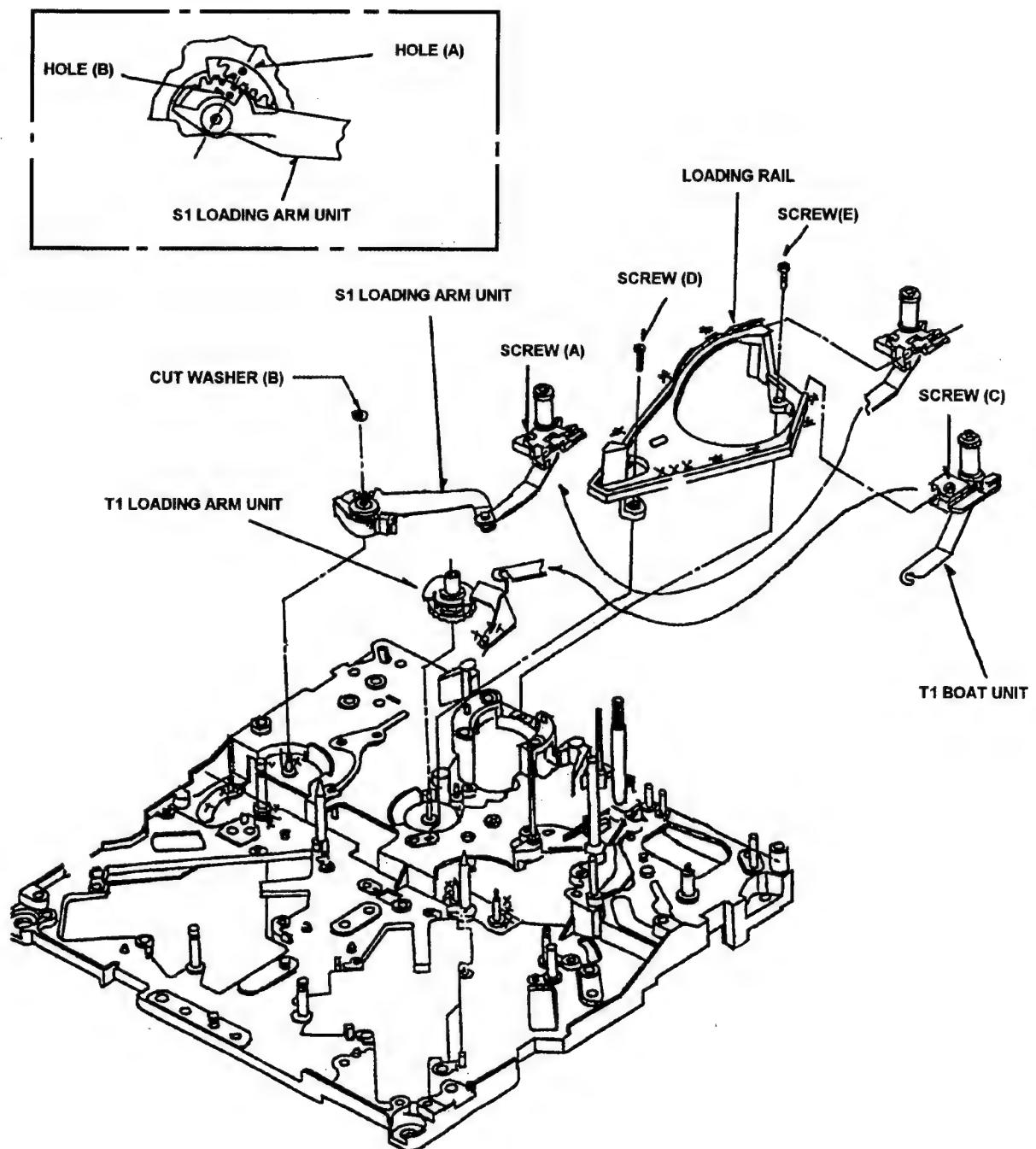


Fig. 4-13-1 Removal of S1 Post Loading Arm Unit

## 4-14. T1 Boat Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Unscrew the screw (C) and remove the T1 Post from Loading Rail as shown in Figure 4-13-1.
3. Hang off the T1 Boat Unit from T1 Loading Arm Unit as shown in Figure 4-13-1.

### <Installation>

1. Install the new T1 Boat Unit follow the removal steps in reverse order.
2. After installation confirm that the T1 Post moving smoothly on the Loading Rail.
3. Linearity adjustment (Refer to item 3-17 [Tape Pass Adjustment Procedure]) should be performed.

## 4-14-1. T1 Loading Arm Unit Replacement and Adjustment

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Remove the cylinder Unit (Refer to item 4-1).
3. Move the T1 Post to loading direction by manual ejecting method until the screw (D) can be removal position as shown in Figure 4-13-1.
4. Unscrew the 2 screws (A) and (C), then remove the S1 and T1 Post from Loading Rail as shown in Figure 4-13-1.
5. Unscrew the 2 screws (D) and (E), then remove the Loading Rail as shown in Figure 4-13-1.
6. Remove the T1 Loading Arm Unit as shown in Figure 4-13-1.

### <Installation>

1. Install the T1 Loading Arm Unit follow the removal steps in reverse order, then Phase Adjustment should be performed as follows.

**Note:** This replacement should be performed simultaneously, replacement of Cylinder Unit. It is convenience for Replacement of T1 Loading Arm Unit.

### <Adjustment>

1. When install the T1 Loading Arm Unit, then the hole (A) should be matched hole (B) as shown in Figure 4-14-1.
2. After installation confirm that the S1 and T1 Post moving smoothly on the Loading Rail.
3. Post Height Pre-adjustment (Refer to item 4-4) and Linearity adjustment (Refer to item 3-17 [Tape Pass Adjustment Procedure]) should be performed.

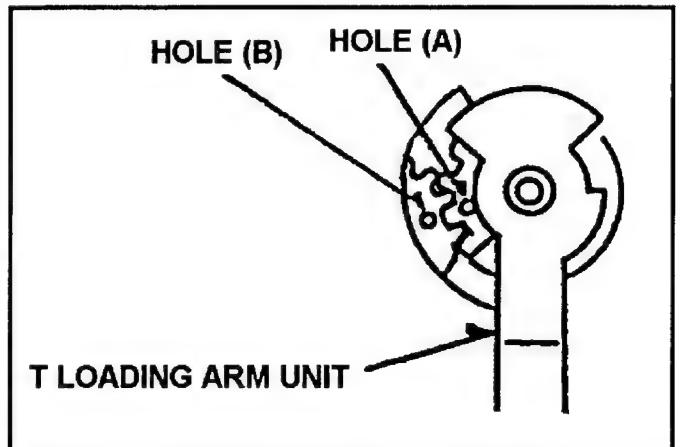


Fig. 4-14-1 Phase Adjustment of T1 Loading Arm Unit

## 4-15. Cleaner Solenoid Replacement and Adjustment

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P11 on the Mech I/F P.C.Board.
3. Unscrew the 2 screws (A) and remove the Cleaner Solenoid Unit as shown in Figure 4-15-1.
4. Unscrew the 2 screws (B) and remove the Cleaner Solenoid as shown in Figure 4-15-1.

### <Installation>

1. Install the new Cleaner Solenoid follow the removal steps in reverse order.
2. After installation, Cleaner Solenoid Position adjustment should be performed as follows.

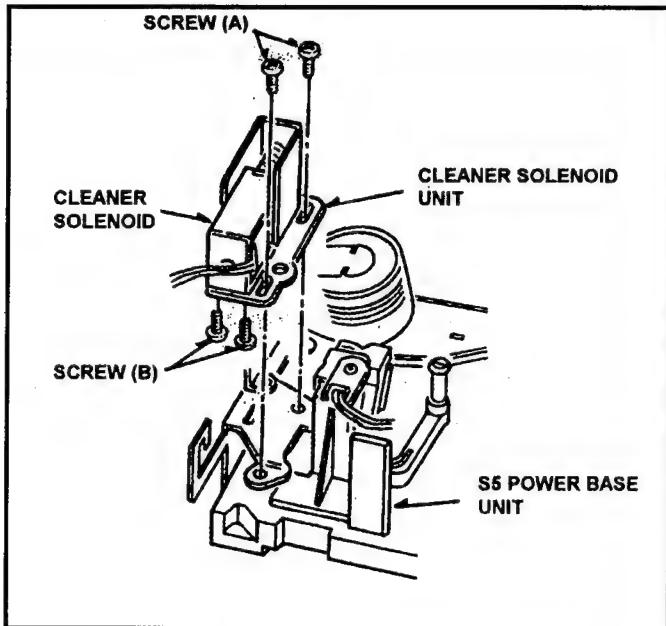


Fig. 4-15-1 Removal of Cleaner Solenoid

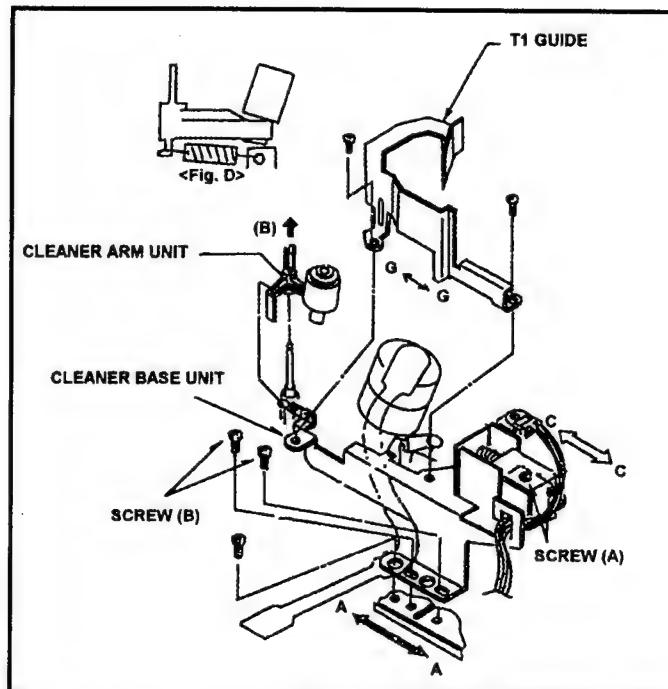


Fig. 4-15-2 Cleaner Solenoid Position Adjustment

#### 4-15-1. Cleaner Solenoid Position Adjustment

※ Tools Required : Eccentric Driver (VFK0357)

1. Press the iron core of Cleaner Solenoid.
2. Observe the clearance (D) between Cleaning Arm Unit and Cleaner Base Plate as shown in Figure 4-15-3. And make sure that it is within 0.5 to 0.7mm.
3. If not, loosen the 2 screws (A) and adjust the position of Cleaner Solenoid Unit by moving arrow direction ( $C \leftrightarrow C$ ) using the Eccentric drive so that the clearance (D) is within specification. And tighten the 2 screws. (Refer to Figure 4-15-2.)
4. After adjustment, confirm that as follow.
5. Press the iron core of Cleaner Solenoid and released it, then the Cleaning Roller is return to original position.
6. Press the iron core of the Cleaner Solenoid and confirm that the Cleaner Roller is rotated, when the Cylinder is rotated by hand.

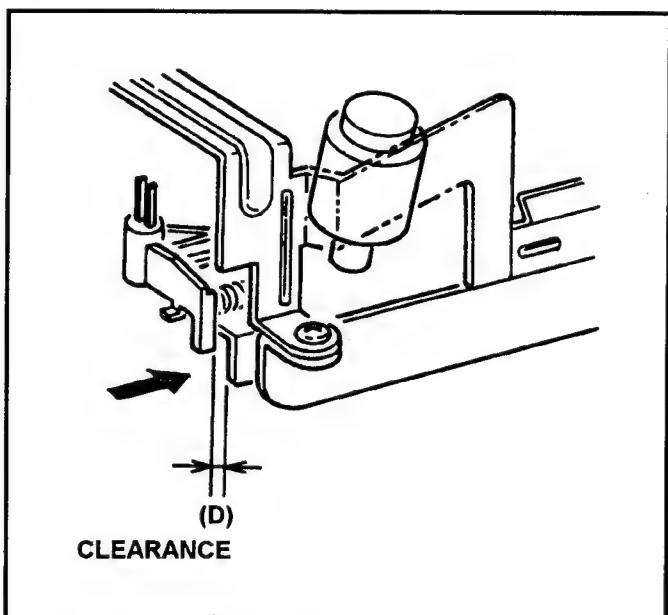


Fig. 4-15-3 Cleaner Solenoid Position Adjustment

**Note:** If remove the cleaner Base Plate, Cleaner roller Position adjustment should be performed.

## 4-15-2. Cleaner Roller Position Adjustment

※ Tools Required : Eccentric Driver (VFK0357)

1. Observe the clearance (A) between Cleaner Roller and cylinder Unit as shown in Figure 4-15-4. And make sure that it is within 1.0 to 1.2mm.
2. If not, loosen the 2 screws (B)1 and adjust the position of Cleaner Base Plate by moving arrow direction ( $A \leftrightarrow A$ ) using the Eccentric driver so that the clearance (A) is within specification. And tighten the 2 screws (B).

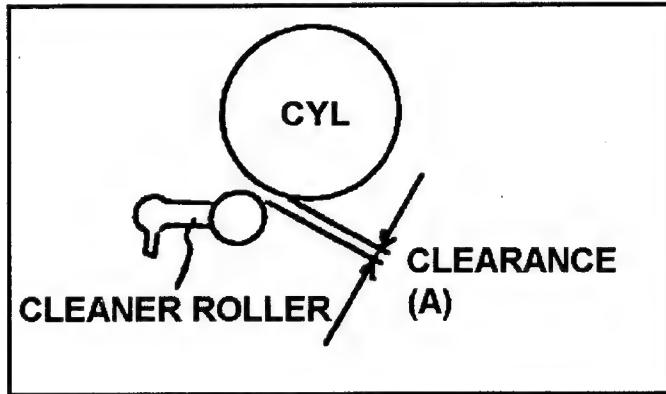


Fig. 4-15-4 Cleaner Roller Position Adjustment

## 4-16. Reel Drive Motor Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Disconnect the connector P16 on the Mech I/F P.C.Board.
3. Unscrew the 2 screws (A) and remove the Reel Drive Sensor P.C.Board as shown in Figure 4-16-1.
4. Unscrew the 2 screws (B) and remove the Reel Drive Motor Unit as shown in Figure 4-16-1.

### <Installation>

1. Install the new Reel Drive Motor Unit follow the removal step in reverse order.

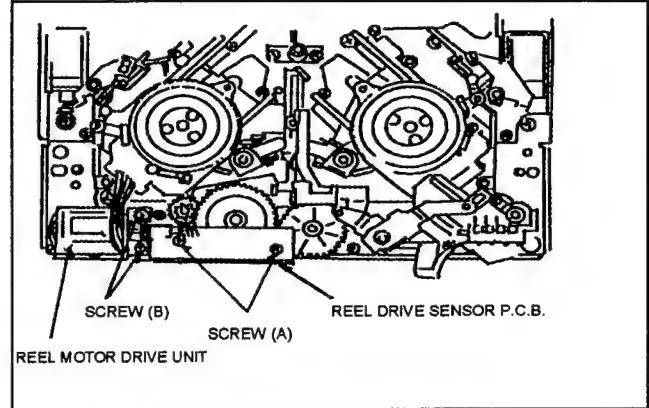


Fig. 4-16-1 Removal of Reel Drive Motor Unit

## 4-17. S5 Post Base Unit Replacement

### <Removal>

1. Remove the Mechanical Unit (Refer to item 2-1, Removal of Mechanical Unit).
2. Unscrew the screw (A) and remove the S5 Post Base Unit as shown in Figure 4-17-1.

### <Installation>

1. Install the S5 post Base Unit follow the removal steps in reverse order, then be careful the S5 Post Base Unit is intsal to mech chassis as shown in Figure 4-17-1.
2. After installation, Post Height pre-adjustment (Refer to item 3-4) and Linearity adjustment (Refer to item 3-17 [Tape Pass Adjustment Procedure]) should be performed.

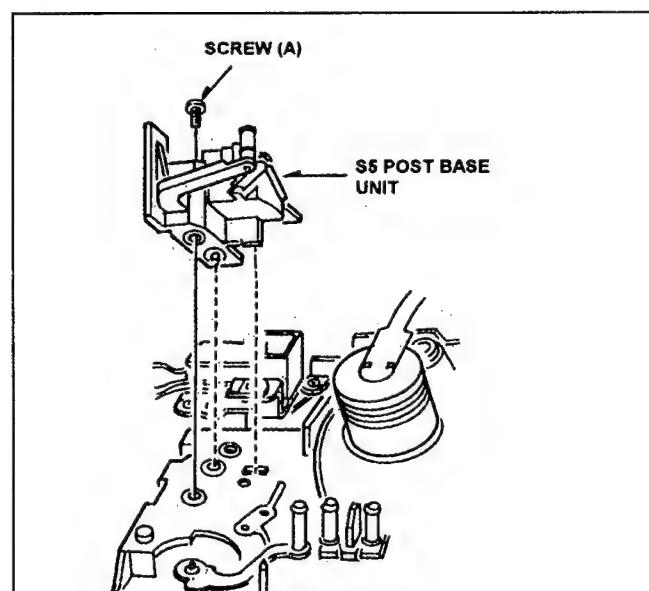


Fig.4-17-1 Removal of Post Base Unit

#### 4-18. Thrust Adjustment Screw Replacement

1. Remove the Thrust Adjustment Screw.
2. Enforce cleaning of point department of capstan shaft with an applicator.
3. Put the oil (VFK0906) on a new Thrust Adjustment Screw, and install the upper end of the Capstan Housing.
4. Turn the Thrus Adjustment Screw slowly to clockwise until the Capstan Rotor just starts turning (separate from the Capstan Rotor).
5. Turn the Thrust Adjustment Screw another an angle of 270° from 180° (about 225°) clockwise as shown in Fig. 4-18-2.)
6. Put the glue (Ex: THree Bond 1401B) on the Thrust Adjustment Screw.
7. Confirm whether the Oil Seal doesn't come in contact with the Capstan Housing.

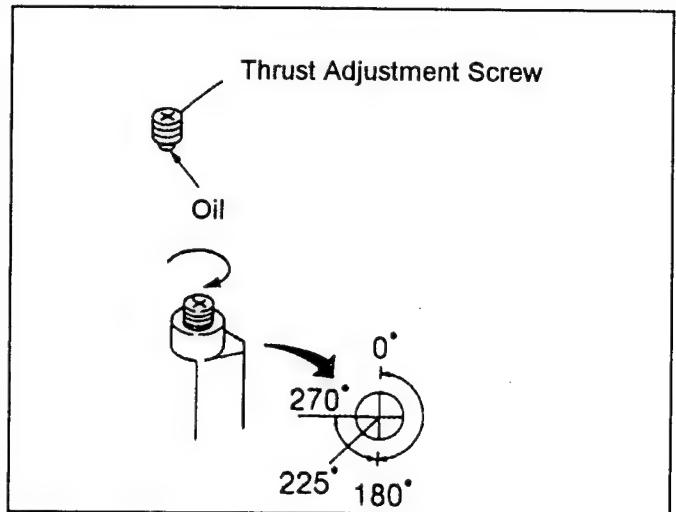


Fig. 4-18-2

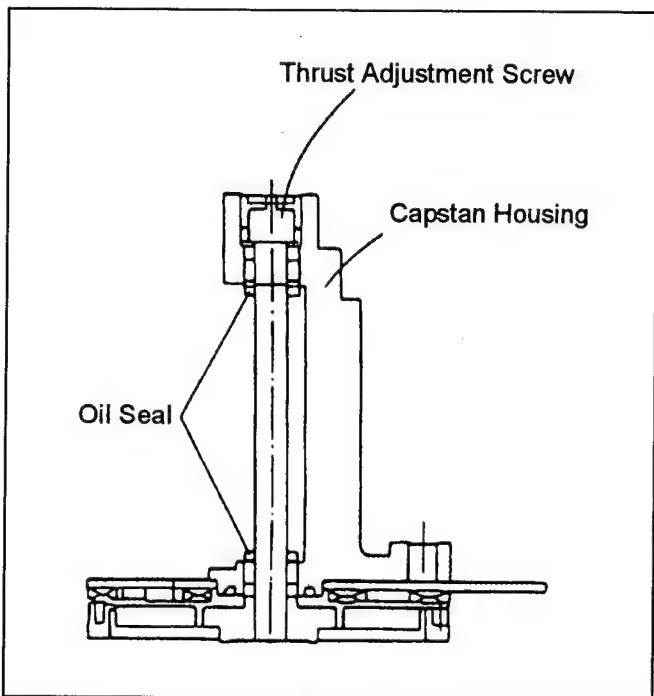


Fig. 4-18-1

**MEMO**

## SECTION 4

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# ELECTRICAL ADJUSTMENTS

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## <<Preparation for adjustment>>

- Turning OFF the PC power
  1. After turning OFF the AJ-DE77, you should press once the HDD Switch on the front panel (i.e., the hole to the right of the floppy disc drive).  
This enables you to activate the VTR only through the Main Power SW ON/OFF.  
Note: Do not turn on and off the HDD if the PC screen appears blue after the OS starts.
- Making connection of AJ-D750 Front Panel  
Refer to the item "Preparation" in the Section "3. Mechanism Adjustment" to make connection of the AJ-D750 Front Panel.  
Note: Be sure to turn OFF the unit before attempting to make connection or disconnection of the Front Panel.

## 1. Power Circuit

1. Extend the Servo C.B.A. (F1) with the Extension Board (VFK1192).
2. Measure each DC line and confirm the voltage in the specification as shown in below.
3. If there are not in the specification, adjust VR1001 and VR1002 so that the +5V, +12V lines voltage becomes in the specification.

	POWER	EXTENSION
SPEC.	ADJUST	TEST POINT
5.25 ± 0.05V	VR1001	TP6 (5V)
-5.6V± 0.25V	CHECK	TP7 (-5V)
7.5V± 0.35V	CHECK	TP4 (7.5V)
-7.7V± 0.35V	CHECK	TP5 (-7.5V)
11.8V± 0.1V	VR1002	TP2 (12V)
-11.8V± 0.6V	CHECK	TP3 (-12V)
15.5V~20.5V	CHECK	TP8 (16.5V)

## 2. Servo Circuit Adjustment

### 2-1. Motor Torque Offset Adjustment

BOARD	SERVO (F1)
SPEC.	15 ± 2g (5 times average)
TEST	Connect Monitor TV to VIDEO OUT3
ADJUST	JOG DIAL
INPUT	_____
MODE	EJECT
TAPE	NO TAPE
M.EQ	VFK1191 (Torque Meter) VFK1152 (Adapter)

1. Turns Power off. Remove the front loading unit with the connection cable or remove the Top Plate of front loading unit, which is fixed by 4 screws.

Then turns Power on.

2. Set the front panel switches as shown below.

Front rear DIP SW1: ON

Front bottom MENU SW: ON

Press the front panel INSERT key and CH1 to turn on the LED.

3. Set the marker at "A00: SERVO" by Jog Dial, and set SET\_SW to ON.
4. Select "A02: T TORQUE" mode by Jog dial.
5. Set a Torque Meter at Take-up Reel and adjust the torque in specification by JOG Dial while pressing JOG/SHTL key. Measure it 5 times and calculate the average, and adjust it so that the average is in the specification.
6. Push JOG Dial to set into JOG mode, and select "A03: S TORQUE".
7. Set a Torque Meter at S-REEL and adjust the torque in specification by JOG Dial while pressing JOG/SHTL key. Measure it 5 times and calculate the average, and adjust it so that the average is in the specification.
8. After adjustment, press the Menu button twice for the VTR is escape from Service Menu mode.
9. Turns Power off and return the front loading unit.

### 2-2. Tension Sensor Voltage Check

Refer to the Mechanical Adjustment Section.

[ 5-7. Tension Arm Offset Voltage Adjustment ]

[ 5-8. Tension Arm Neutral Position Adjustment ]

[ 5-9. Tension Arm PLAY Voltage Adjustment ]

### 2-3. PG Shifter Adjustment

BOARD	SERVO (F1)
SPEC.	t1, t2 = 125.9μs ± 2μs
TEST	TP722, TP728
ADJUST	SERCH BUTTON
INPUT	_____
MODE	×4PLAY
TAPE	NTSC: VFM3580KM (0min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	Oscilloscope

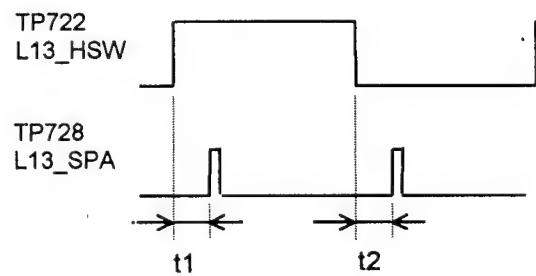
1. Set the Front Switches as shown below.

Front Rear DIP SW1: ON

Front Bottom MENU SW: ON

Press the front panel INSERT key and CH1 to turn on the LED.

2. Set the Marker at "A00: SERVO" by JOG dial so that the SET\_SW is on.
3. Select to "A01: PG SHIFT" by JOG dial.
4. Playback the color bar portion of alignment tape.
5. Press search button and keep it until the number which is displayed at right of PG SHIFT is renewed.
6. Connect the scope to TP722 and TP728. Trigger the scope by TP722. Then it is displayed as shown in figure.
7. Confirm the t1 and t2 of L13\_HSW and L13\_SPA are 125.9 uS ± 2 uS .



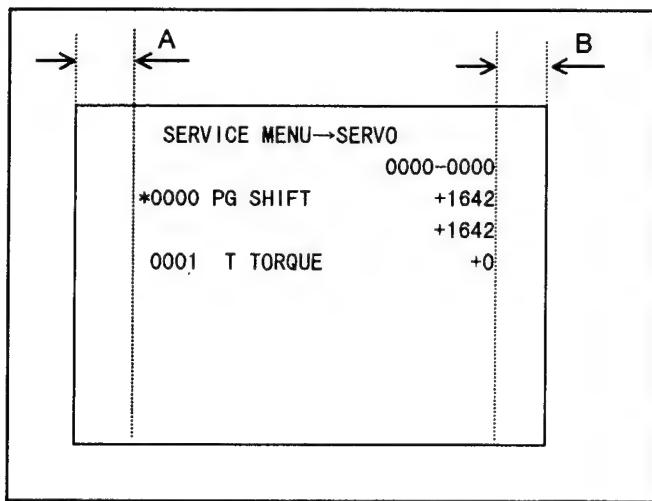
### 3. System Control Circuit

#### 3-1. Super Impose Position Adjustment

BOARD	SERVO (F2)
SPEC.	A = B (See below)
TEST	_____
ADJUST	VC1
INPUT	_____
MODE	EE
TAPE	_____
M.EQ	Monitor TV

1. Press the INSERT CH1 button on the Front Panel.  
(The LED is on.)

Front bottom MENU SW: ON



2. Adjust VC1 so that the width A and B are equal.

NOTE: The menu may be different from the above figure.

#### 3-2. Photo Sensor Voltage Adjustment

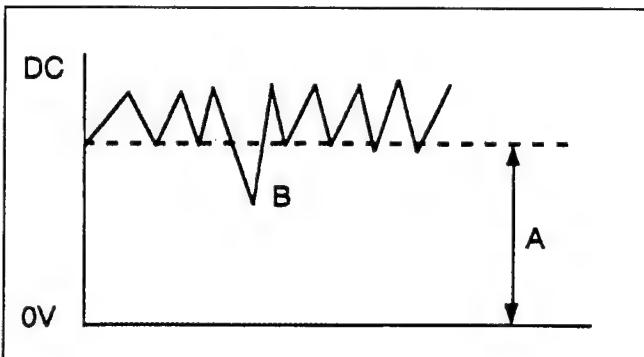
BOARD	SYSCON (F2)
SPEC.	A = 3.0V~4.3V
TEST	P2-25A (S Photo), P2-26A (T Photo)
ADJUST	SW200 (MECH I/F)
INPUT	_____
MODE	STOP
TAPE	TAPE SENSOR CASSETTE VFK1369
M.EQ	Oscilloscope

1. Insert the Tape Sensor Adjustment Cassette (VFK1369).
2. Set the SW200 on the Mech I/F C.B.A. so that S and T DC level becomes within 3.00~4.3V.

S Photo	T Photo	UP ←		A Voltage		→		Down	
		OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW-1	SW-4	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW-2	SW-5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW-3	SW-6	OFF	OFF	OFF	OFF	ON	ON	ON	ON
Resistor Value		820	3300	1050	880	750	660	460	420

S Photo Voltage: SW200 1-3

T Photo Voltage: SW200 4-6



## 4. EQ Circuit

### <Preparation for Adjustment>

#### ● AJ-D750 Front Panel SW Setting

DIP SW (Rear) : SW1 ON (SW2 - 4 OFF)  
CF SW (Bottom) : 4F  
CONTROL (Front) : LOCAL

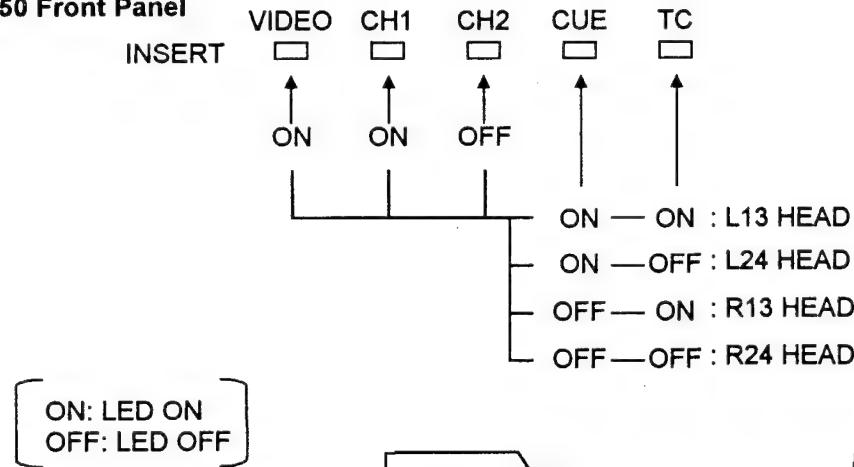
#### ● Service Menu Setting

- 1) AJ-D750 Front Panel → Press the INSERT "CH1" Button. (This button LED should only light up.)
- 2) AJ-DE750 Front Panel → "MENU" Button
- 3) B00 : EQ1 or C00 : Choose EQ2 ADJUST. → "SET" Button
- 4) B29 : ECC MODE — ALL OFF  
B30 : CONCEAL MODE — OFF  
B31 : VITERBI MODE — OFF  
B32 : ERROR MODE — FAST  
B33 : EQ AUTO ADJ — STOP  
B34 : NTSC 8F MODE — OFF  
Make settings as shown above

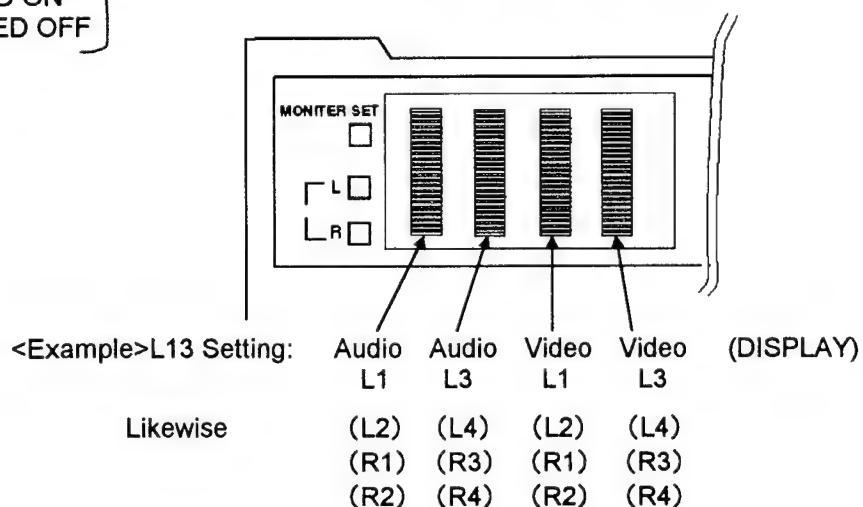
**Note:** When the service menu is finished, each setting returns to the default value.

### <Displaying Error Rate>

#### AJ-DE750 Front Panel



#### Meter Display



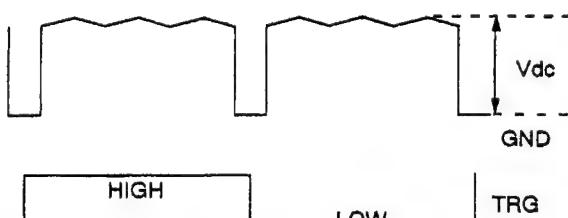
## 4-1. Envelope Level Adjustment

BOARD	RF BUFFER 1 & 2
SPEC.	VDC = $2.5V \pm 0.2V$
TEST	See below.
ADJUST	See below.
INPUT	—
MODE	$\times 4$ PLAY
TAPE	VFM3680KM
M.EQ	Oscilloscope

1. Playback the master tape.
2. Adjust the following items in the service menu so that VDC level becomes  $2.5V \pm 0.2V$ .

(SERVICE MENU)

D00	: RF ADJUST
—	D09 : RF MAG L1
—	D10 : RF MAG L3
—	D11 : RF MAG L2
—	D12 : RF MAG L4
—	D13 : RF MAG R1
—	D14 : RF MAG R3
—	D15 : RF MAG R2
—	D16 : RF MAG R4



	Board	TP	Menu Item	Trigger TP
1	RF Buffer 1	TP18	RF_MAG_L1	TP1 HIGH
2	RF Buffer 1	TP18	RF_MAG_L3	TP1 LOW
3	RF Buffer 1	TP20	RF_MAG_L2	TP2 HIGH
4	RF Buffer 1	TP20	RF_MAG_L4	TP2 LOW
5	RF Buffer 2	TP18	RF_MAG_R1	TP1 HIGH
6	RF Buffer 2	TP18	RF_MAG_R3	TP1 LOW
7	RF Buffer 2	TP20	RF_MAG_R2	TP2 HIGH
8	RF Buffer 2	TP20	RF_MAG_R4	TP2 LOW

## 4-2. PLL LOCK Adjustment

BOARD	EQ 1 & 2
SPEC.	$2.1V \pm 200mV$
TEST	See below.
ADJUST	See below.
INPUT	—
MODE	$\times 4$ PLAY
TAPE	VFM3680KM
M.EQ	Oscilloscope

1. Playback the master tape.
2. Confirm DC level is in the specification. If it is not, adjust following VR.

(SERVICE MENU)

B00	: EQ1 ADJUST
—	B01 : PLL PHASE L13
—	B02 : PLL SLICE L13
—	B10 : PLL PHASE 024
—	B11 : PLL SLICE L24

C00	: EQ2 ADJUST
—	C01 : PLL PHASE R13
—	C02 : PLL SLICE R13
—	C10 : PLL PHASE R24
—	C11 : PLL SLICE R24

	Board	TP	Adjust	Trigger TP
L13	EQ 1	TP304	VR301	TP1 (RF Buffer 1)
L24	EQ 1	TP204	VR201	TP1 (RF Buffer 1)
R13	EQ 2	TP304	VR301	TP1 (RF Buffer 1)
R24	EQ 2	TP204	VR201	TP1 (RF Buffer 1)

3. If PLL is not LOCK, adjust following service menu items.

L13	EQ1 Menu → PLL_PHASE_L13 and PLL_SLICE_L13
L24	EQ1 Menu → PLL_PHASE_L24 and PLL_SLICE_L24
R13	EQ2 Menu → PLL_PHASE_R13 and PLL_SLICE_R13
R24	EQ2 Menu → PLL_PHASE_R24 and PLL_SLICE_R24

4. After re-adjust above items, repeat the step 2 and confirmed the DC level.
5. Confirm the picture is surely appeared every time when operated STOP  $\leftrightarrow$  PLAY mode.

### 4-3. RF BUFFER Phase Adjustment

BOARD	—
SPEC.	Minimize the error rate.
TEST	—
ADJUST	Service Menu (See below.)
INPUT	—
MODE	× 4 PLAY
TAPE	VFM3680KM
M.EQ	AJ-D750 Front Panel

#### <Procedure>

- ① Before adjusting, make settings on the INSERT key as follows: CH1: ON, CH2: ON, CUE: ON, and TC: ON.
- ② Make adjustments of the Adjustment Menu and INSERT key as shown below.
- ③ Playback the master tape

	MENU (D00: RF ADJUST)	INSERT key (ON or OFF = LED ON/OFF)					
		VIDEO	CH1	CH2	CUE	TC	
1	D01: RF PHASE L1	ON	ON	ON	ON	ON	
2	D02: RF PHASE L3						
3	D03: RF PHASE L2						
4	D04: RF PHASE L4						
5	D05: RF PHASE R1		OFF	OFF	OFF		
6	D06: RF PHASE R3						
7	D07: RF PHASE R2						
8	D08: RF PHASE R4						

### 4-4. EQ Adjustment

BOARD	—
SPEC.	Minimize the error rate.
TEST	—
ADJUST	Service Menu (See below.)
INPUT	—
MODE	× 4 PLAY
TAPE	NTSC: VFM3580KM, PAL: VFM3680KM
M.EQ	AJ-D750 Front Panel

1. Adjust each head to minimize the error rate by following the items in the service menu.

#### <Procedure>

- ① Before adjusting, make settings on the INSERT key as follows: CH1: ON, CH2: ON, CUE: ON, and TC: ON.

- ② Make adjustments of the Adjustment Menu and INSERT key as shown below.
- ③ Playback the master tape

MENU	INSERT key (ON or OFF = LED ON/OFF)				
	VIDEO	CH1	CH2	CUE	TC
L13 Adjustment (B00: EQ1 ADJUST)					
1 B01: PLL PHASE L13	ON	ON	OFF	ON	ON
2 B02: PLL PHASE L13					
3 B08: MAIN DL L13					
4 B03: AEQ L13					
5 B04: GAIN L1					
6 B05: PHASE L1					
7 B06: GAIN L3					
8 B07: PHASE L3					
9 B01: PLL PHASE L13					
10 B02: PLL SLICE L13					
L24 Adjustment (B00: EQ1 ADJUST)					
11 B10: PLL PHASE L24	ON	ON	OFF	ON	OFF
12 B11: PLL SLICE L24					
13 B17: MAIN DL L24					
14 B12: AEQ L24					
15 B13: GAIN L2					
16 B14: PHASE L2					
17 B15: GAIN L4					
18 B16: PHASE L4					
19 B10: PLL PHASE L24					
20 B11: PLL SLICE L24					
R13 Adjustment (C00: EQ2 ADJUST)					
21 C01: PLL PHASE R13	ON	ON	OFF	OFF	ON
22 C02: PLL PHASE R13					
23 C08: MAIN DL R13					
24 C03: AEQ R13					
25 C04: GAIN R1					
26 C05: PHASE R1					
27 C06: GAIN R3					
28 C07: PHASE R3					
29 C01: PLL PHASE R13					
30 C02: PLL SLICE R13					
R24 Adjustment (C00: EQ2 ADJUST)					
31 C10: PLL PHASE R24	ON	ON	OFF	OFF	OFF
32 C11: PLL SLICE R24					
33 C17: MAIN DL R24					
34 C12: AEQ R24					
35 C13: GAIN R2					
36 C14: PHASE R2					
37 C15: GAIN R4					
38 C16: PHASE R4					
39 C10: PLL PHASE R24					
40 C11: PLL SLICE R24					

## 4-5. VITERBI GAIN Adjustment

BOARD	_____
SPEC.	Minimize the error rate.
TEST	_____
ADJUST	Service Menu (See below.)
INPUT	_____
MODE	× 4 PLAY
TAPE	NTSC: VFM3580KM, PAL: VFM3680KM
M.EQ	AJ-D750 Front Panel

1. Adjust each head to minimize the error rate by following the items in the service menu.
2. Set the service menu B31 or C31 : VITERBI MODE to ON.

### <Procedure>

- ① Before adjusting, make settings on the INSERT key as follows: CH1: ON, CH2: ON, CUE: ON, and TC: ON.
- ② Make adjustments of the Adjustment Menu and INSERT key as shown below.
- ③ Playback the master tape

	MENU (B00: EQ1 ADJUST) (C00: EQ2 ADJUST)	INSERT key (ON or OFF = LED ON/OFF)				
		VIDEO	CH1	CH2	CUE	TC
1	B09: VTB GAIN L13	ON	ON	OFF	ON	ON
2	B18: VTB GAIN L24				ON	OFF
3	C09: VTB GAIN R13				OFF	ON
4	C18: VTB GAIN R24				OFF	OFF

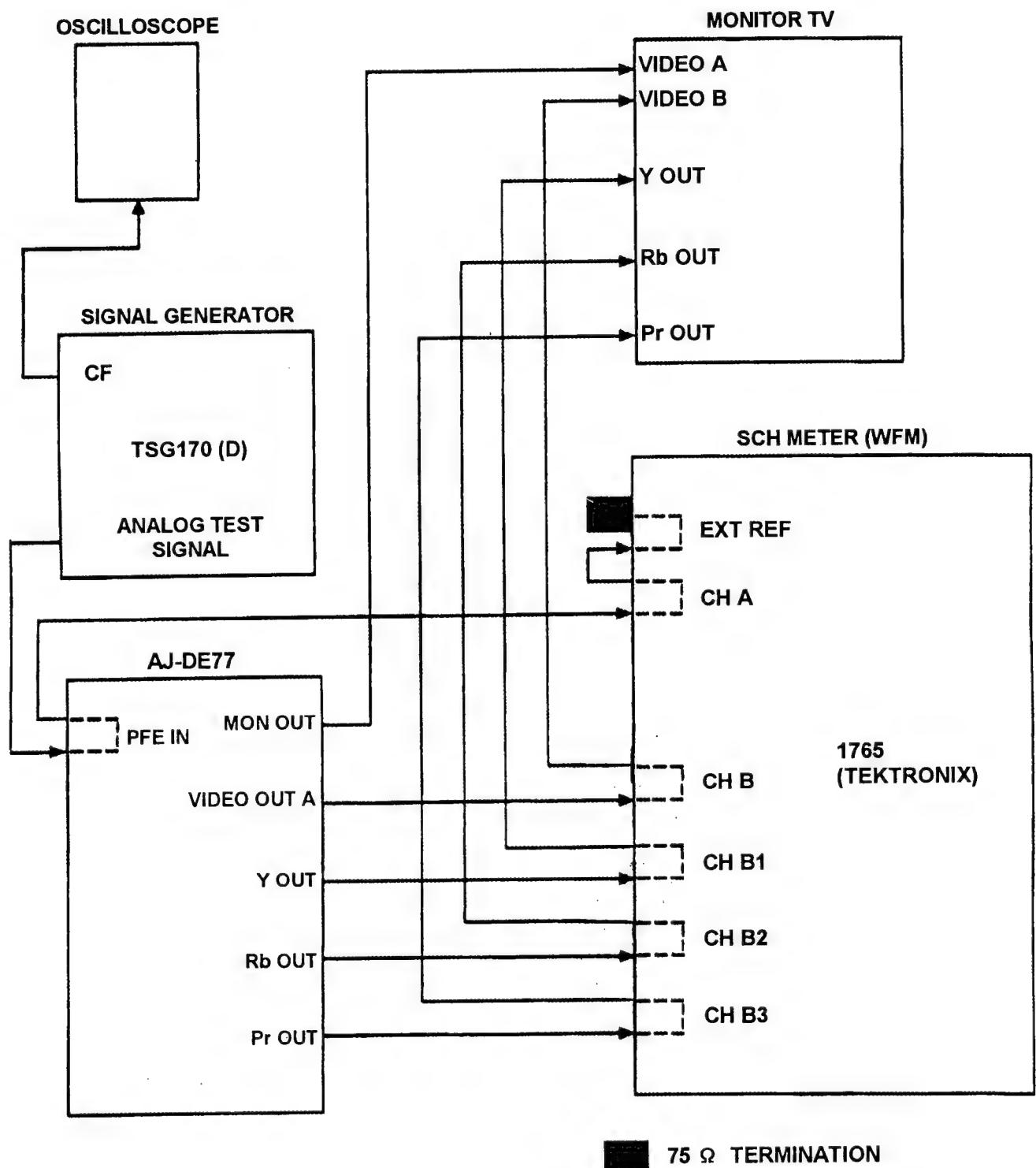
## 4-6. ERROR RATE Confirmation

1. Change the Service Menu setting:
  - B29 : ECC MODE — ALL OFF
  - B30 : CONCEAL MODE — OFF
  - B31 : VITERBI MODE — ON
  - B32 : ERROR MODE — SLOW
2. Playback the master tape. (× 4 PLAY)
3. Make sure that the VIDEO error rate of each head read in the meter is 6 or less.

## 5. Video Out P.C. Board

### 5.1 Preparation for Video Out Adjustment

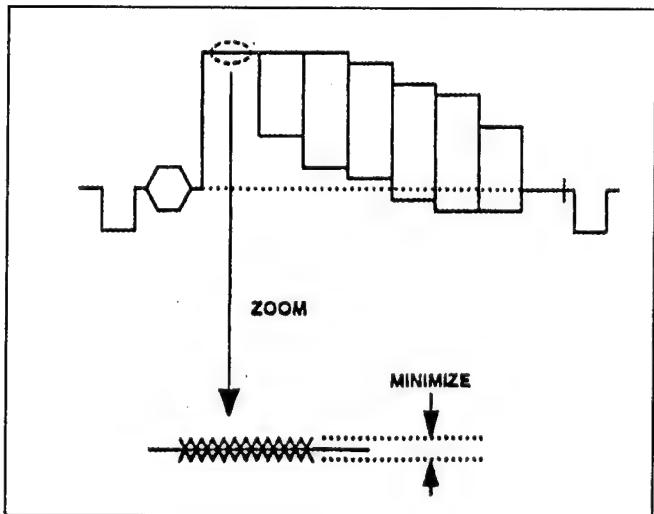
1. Connect the equipment as shown in Figure.



## 5-2. Carrier Balance Adjustment

BOARD	V_OUT (F5)
SPEC.	Lower than 4mVp-p
TEST	VIDEO-1 output
ADJUST	VR806, VR807
INPUT	—
MODE	×4 PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

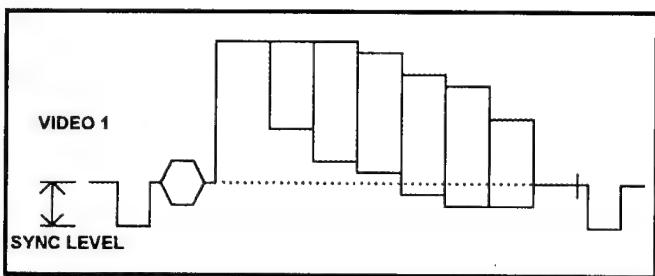
1. Set the "F00: VIDEO ADJUST → E03: VIDEO MUTE - MUTE" in the Service Menu.
2. Playback the color bar portion of Alignment Tape.
3. Use the WFM Monitor in the single line sweep mode and set the chroma Filter on and set the GAIN in the maximum position.
4. Adjust VR806 and VR807 so that the Level at A portion is minimum.
  - A portion is the white part of a color bar and the part does not have chrominance.
5. After completed this adjustment, turn the V MUTE mode in the service menu to OFF.



## 5-3. Sync Level Adjustment

BOARD	V_OUT (F5)
SPEC.	NTSC: 40 IRE ±1% PAL: 0.3V ±1%
TEST	VIDEO-1 output
ADJUST	VR950
INPUT	Color Bar
MODE	×4 PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

1. Playback the color bar portion of the alignment tape.
2. Adjust VR950 so that the Sync Level is in the specification.

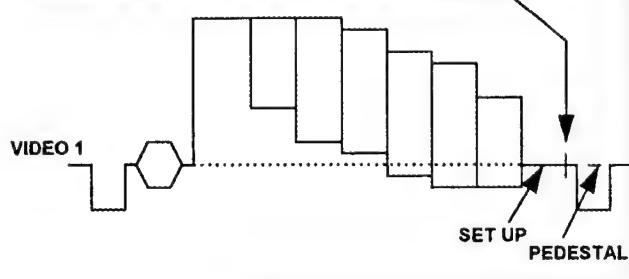


#### 5-4. Composite Set Up Level Adjustment

BOARD	V_OUT (F5)
SPEC.	NTSC: $\pm 1$ IRE, PAL: $\pm 5$ mV
TEST	VIDEO-1
ADJUST	VR902 (H-2)
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

1. Playback the color bar portion of the alignment tape.
2. Adjust VR902 so that the set up level is same as pedestal level.

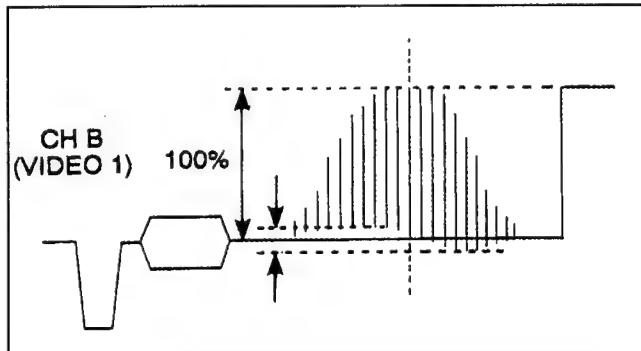
Adjust set-up level as same level as Pedestal level.



#### 5-5. Composite Y/C Timing Adjustment

BOARD	V_OUT (F5)
SPEC.	0 $\pm 10$ ns
TEST	VIDEO-1
ADJUST	VR903 (I-1)
INPUT	Color Bar
MODE	Playback
TAPE	NTSC: VFM3580KM (22min to 26min) PAL: VFM3680KM (18min to 22min)
M.EQ	WFM Monitor

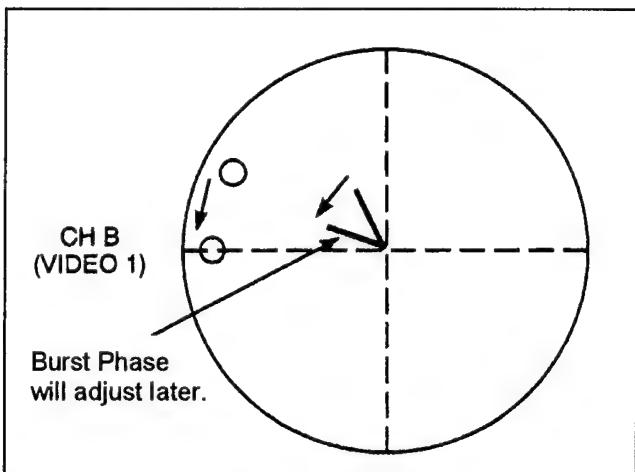
1. Playback the 12.5T pulse signal portion of the Alignment Tape.
2. So the WFM monitor in the Y/C timing measuring mode.
3. Adjust VR903 so that the waveform becomes as shown in below.



## 5-6. System Sub-Carrier Phase Adjustment

BOARD	V_OUT (F5)
SPEC.	0 $\pm$ 1°
TEST	VIDEO-1
ADJUST	VR160
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	SCH Meter

1. Playback the color bar portion of the Alignment Tape.
2. Adjust VR160 so that the SCH of VIDEO OUT is same as EXTREF-IN.
  - The burst phase adjustment should be made in the section "5-7. Burst Phase Adjustment" as shown below.

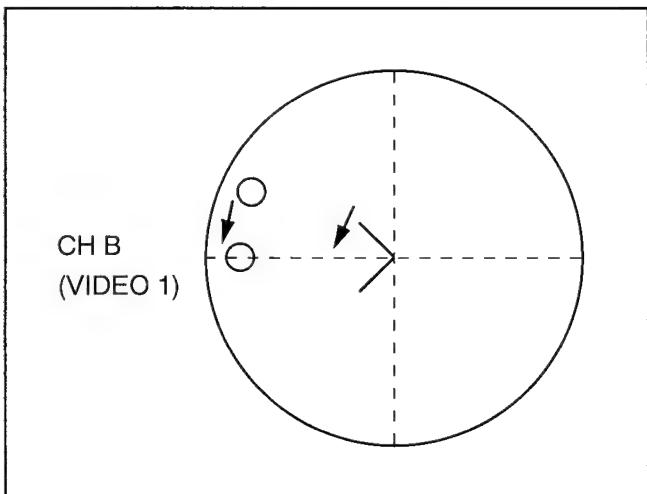


## 5-7. Burst Phase Adjustment

BOARD	V_OUT (F4)
SPEC.	0 $\pm$ 1°
TEST	VIDEO-1
ADJUST	VR280 (B-1)
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	SCH Meter

1. Playback the color bar portion of the Alignment Tape.

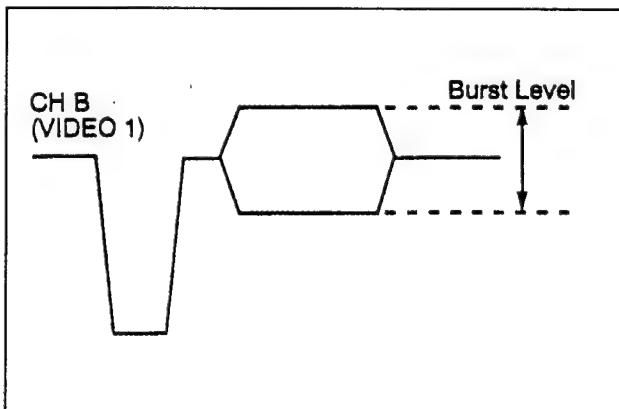
1. Adjust VR280 so that the phase difference of the burst between REF IN and VIDEO are in the specification.



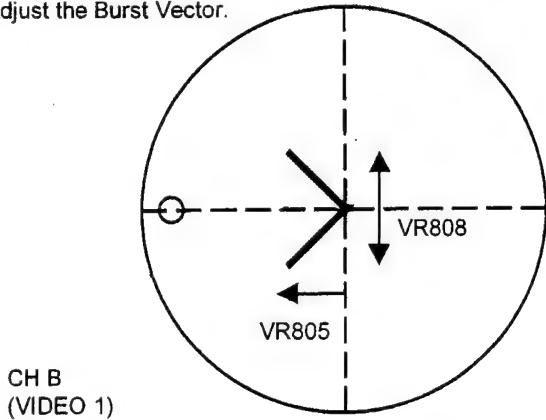
## 5-8. Burst Level Adjustment

BOARD	V_OUT (F5)
SPEC.	NTSC: 40 IRE $\pm$ 1%, PAL: 0.3V $\pm$ 1%
TEST	VIDEO-1
ADJUST	VR805, VR808
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

1. Playback the color bar portion of the Alignment Tape.
2. Adjust VR805 and VR808 so that the Burst Level in the specification.



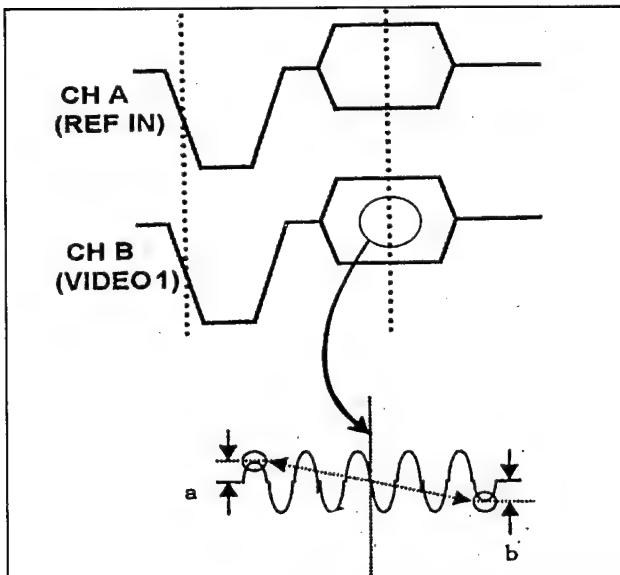
Adjust the Burst Vector.



### 5-9. Burst Phase Position Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	$A = B \pm 5\%$
<b>TEST</b>	VIDEO-1
<b>ADJUST</b>	VR201 (C-1)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
<b>M.EQ</b>	WFM Monitor

1. Playback the color bar portion of the Alignment Tape.
2. Set the WFM monitor so that the center portion of the burst for the sync of REF IN and VIDEO OUT are same as phase position.

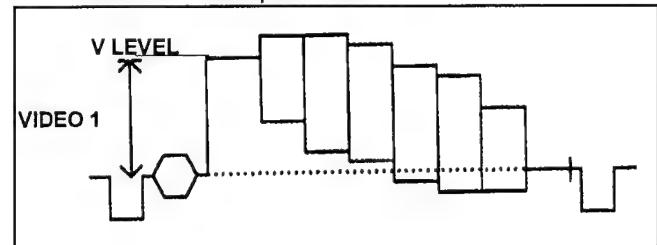


3. Adjust VR201 so that the width of burst (CH B) is match with REF signal (CH A) as shown in Figure.

### 5-10. Composite Y Level Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	NTSC: 100IRE $\pm 1\%$ , PAL: 0.7V $\pm 1\%$
<b>TEST</b>	VIDEO-1
<b>ADJUST</b>	VR900 (J-1)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
<b>M.EQ</b>	WFM Monitor

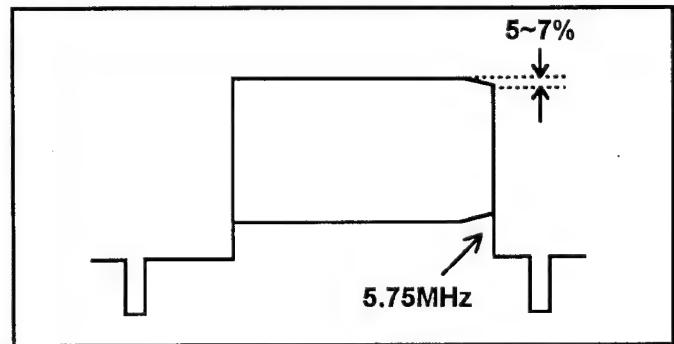
1. Playback the color bar portion of the Alignment Tape.
2. Adjust VR900 so that the Y Level of composite Video is in the specification.



### 5-11. Composite Y Frequency Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	5.75MHz $-5\%$ to $-7\%$
<b>TEST</b>	Y_OUT
<b>ADJUST</b>	VR901
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (14min to 18min) PAL: VFM3680KM (10min to 14min)
<b>M.EQ</b>	WFM Monitor

1. Playback the H sweep portion of the Alignment Tape.
2. Adjust VR901 so that the frequency characteristic is flat.
3. The right part of the H sweep frequency is 5.75MHz and the tolerance is  $-5\%$  to  $-7\%$ .



## 5-12. Vector Adjustment

BOARD	V_OUT (F5)
SPEC.	All dots into the marker of Scope
TEST	VIDEO-1
ADJUST	VR804(H-1), VR801(H-1), VR803(H-1), VR802(I-1)
INPUT	Color Bar
MODE	×4 PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	Vector Scope

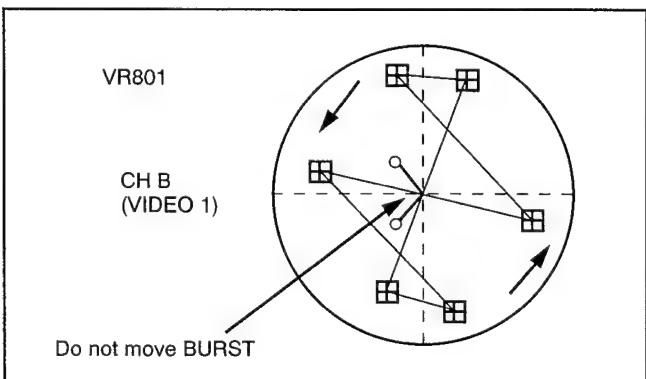
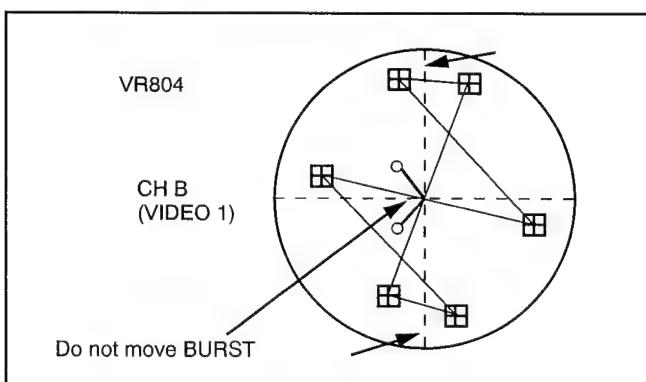
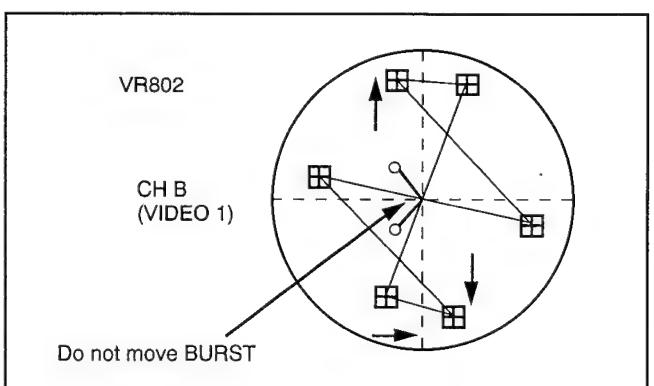
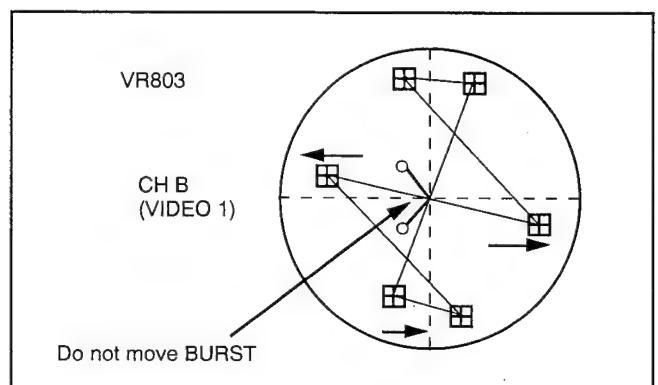
1. Playback the color bar portion of the Alignment Tape
2. Set the burst position on the Vector Scope at correct position.
3. Adjust VR804, VR801, VR803 and VR802 so that the color bar's each vector points are in the square mark on the vector scope.

VR804 : Diagonal Direction

VR801 : Rotary Direction

VR803 : Horizontal Direction

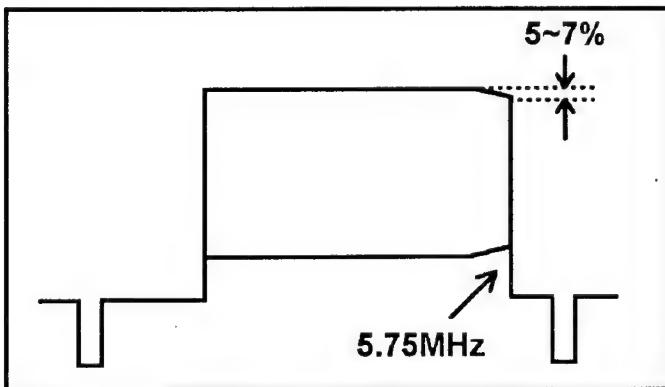
VR802 : Vertical Direction



### 5-13. Component Y Frequency Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	5.75MHz -5% to -7%
<b>TEST</b>	Y_OUT
<b>ADJUST</b>	VR701 (H-3)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (14min to 18min) PAL: VFM3680KM (10min to 14min)
<b>M.EQ</b>	WFM Monitor

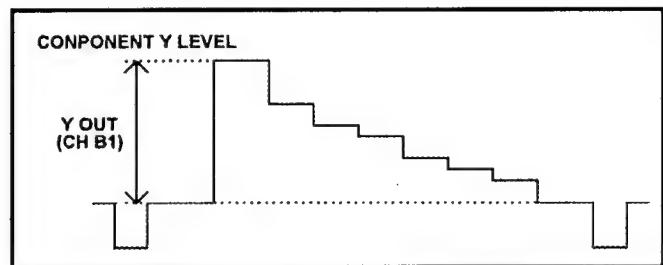
1. Playback the H sweep portion of the Alignment Tape.
2. Adjust VR701 so that the frequency characteristic is flat.
1. The right part of the H sweep frequency is 5.75MHz and the tolerance is -5% to -7%.



### 5-14. Component Y Level Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	700mV $\pm$ 1%
<b>TEST</b>	Y_OUT
<b>ADJUST</b>	VR700 (G-1)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
<b>M.EQ</b>	WFM Scope

1. Confirm the SW940 on the F5 Board is at M II side.
2. Adjust VR700 so that the component Y Level is in the specification.

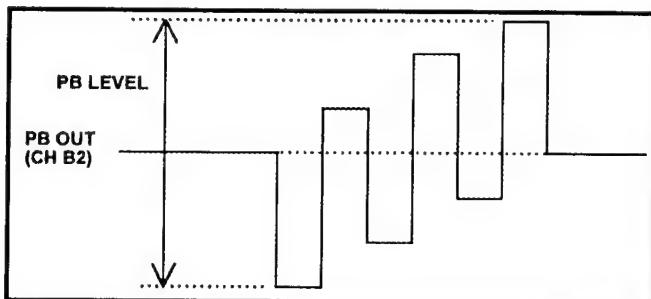


## 5-15. Component Pb Level Adjustment

BOARD	V_OUT (F5)
SPEC.	700mV $\pm$ 1%
TEST	PB_OUT
ADJUST	VR706 (G-1)
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

Confirm the SW940 is at MI side.

1. Playback the color bar portion of the Alignment Tape.
2. Adjust VR706 so that the Pb Level of component out is in the specification.



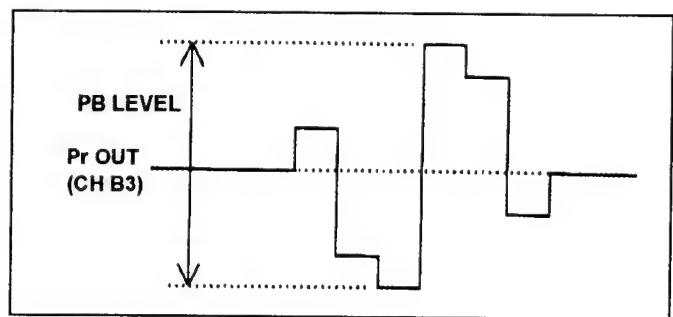
## 5-16. Component Pr Level Adjustment

BOARD	V_OUT (F5)
SPEC.	700mV $\pm$ 1%
TEST	PR_OUT
ADJUST	VR704 (G-1)
INPUT	Color Bar
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (7min to 14min) PAL: VFM3680KM (0min to 10min)
M.EQ	WFM Monitor

Confirm the SW940 is at MI side.

1. Playback the color bar portion of the Alignment Tape.
2. Adjust VR704 so that the Pr Level of Component out is in the specification.

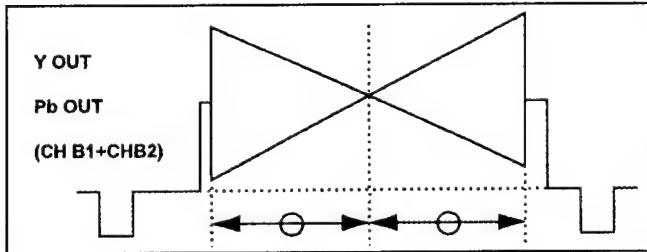
NOTE: SW940 set to BATA side.



## 5-17. Component Y-Pb Timing Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	$0 \pm 10\text{nS}$
<b>TEST</b>	Y_OUT, PB_OUT
<b>ADJUST</b>	VR705 (F-1)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (18min to 22min) PAL: VFM3680KM (18min to 22min)
<b>M.EQ</b>	WFM Monitor

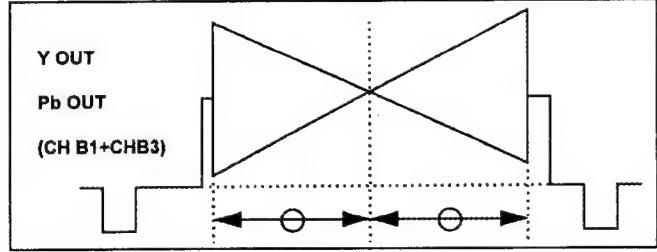
1. Playback the BOWTIE portion of the Alignment Tape.
2. Set the WFM monitor in the YC timing adjustment mode.
3. Adjust VR705 so that the cross point of envelope is at center.



## 5-18. Component Y-Pr Timing Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	$0 \pm 10\text{nS}$
<b>TEST</b>	Y_OUT, PR_OUT
<b>ADJUST</b>	VR702 (H-1)
<b>INPUT</b>	Color Bar
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (18min to 22min) PAL: VFM3680KM (18min to 22min)
<b>M.EQ</b>	WFM Monitor

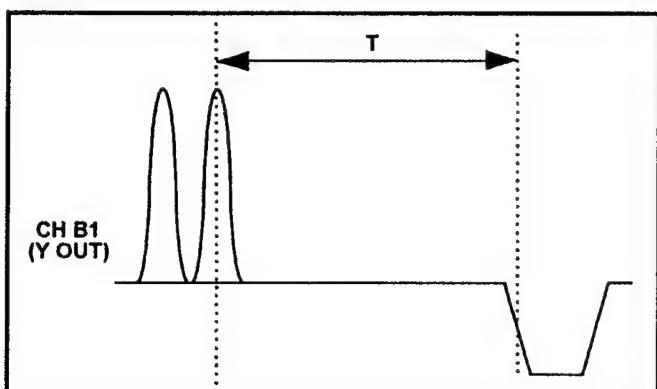
1. Playback the BOWTIE portion of the Alignment Tape.
2. Set the WFM monitor in the YC timing measuring mode.
3. Adjust VR702 so that the cross point of envelope is at the center.



## 5-19. Video Phase Adjustment

<b>BOARD</b>	V_OUT (F5)
<b>SPEC.</b>	NTSC: $T=1.26 \pm 0.02\mu s$ , PAL: $T=0.96 \pm 0.02\mu s$
<b>TEST</b>	Y_OUT
<b>ADJUST</b>	VR260
<b>INPUT</b>	Active Area Marker
<b>MODE</b>	$\times 4$ PLAY
<b>TAPE</b>	NTSC: VFM3580KM (26 min. at least) PAL: VFM3680KM (26 min. at least)
<b>M.EQ</b>	WFM Monitor

1. Open the Video menu on the Service Menu. (F00 : VIDEO)
2. Select the item "E01: VIDEO BLANK" and set to OFF.
3. Playback the active area marker portion of the Alignment Tape.
4. Adjust VR206 so that the period "T" between sync edge and center of the pulse in the specification.
5. After completed this adjustment, the menus set back to "NORMAL" position..



## 6. CUE Circuit

### 6-1. CUE PB LEVEL ADJUSTMENT

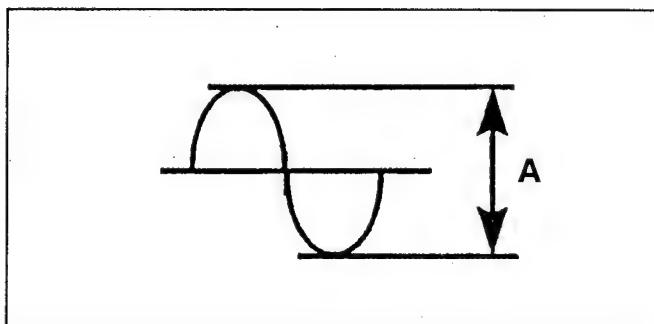
BOARD	CUE (H5)
SPEC.	0dBu $\pm$ 0.5dB
TEST	MONITOR OUT (Lch/Rch)
ADJUST	VR4002
INPUT	—
MODE	$\times 4$ PLAY
TAPE	NTSC: VFM3580KM (0 to 14min) PAL: VFM3680KM
M.EQ	AUDIO METER

1. Playback the CUE LEVEL portion of the Alignment Tape.
2. Adjust VR4002 so that the Lch OUT level is in the specification.
3. Confirm the Rch OUT level is in the specification too.

### 6-2. CTL/CUE ERASE CURRENT ADJUSTMENT

BOARD	CUE (H5)
SPEC.	$A = 290\text{mVp-p} \pm 50\text{mV}$
TEST	TP4202 (CUE), TP4203 (CTL) TP4201 (GND)
ADJUST	VR4203 (CUE), T4204 (CTL)
INPUT	—
MODE	REC
TAPE	BLANK
M.EQ	OSCILLOSCOPE

1. Place the unit to X4 REC mode.
2. Adjust T4203 so that the TP4202 Voltage is in the specification.
3. Adjust T4204 so that the TP4203 Voltage is in the specification



# SECTION 5

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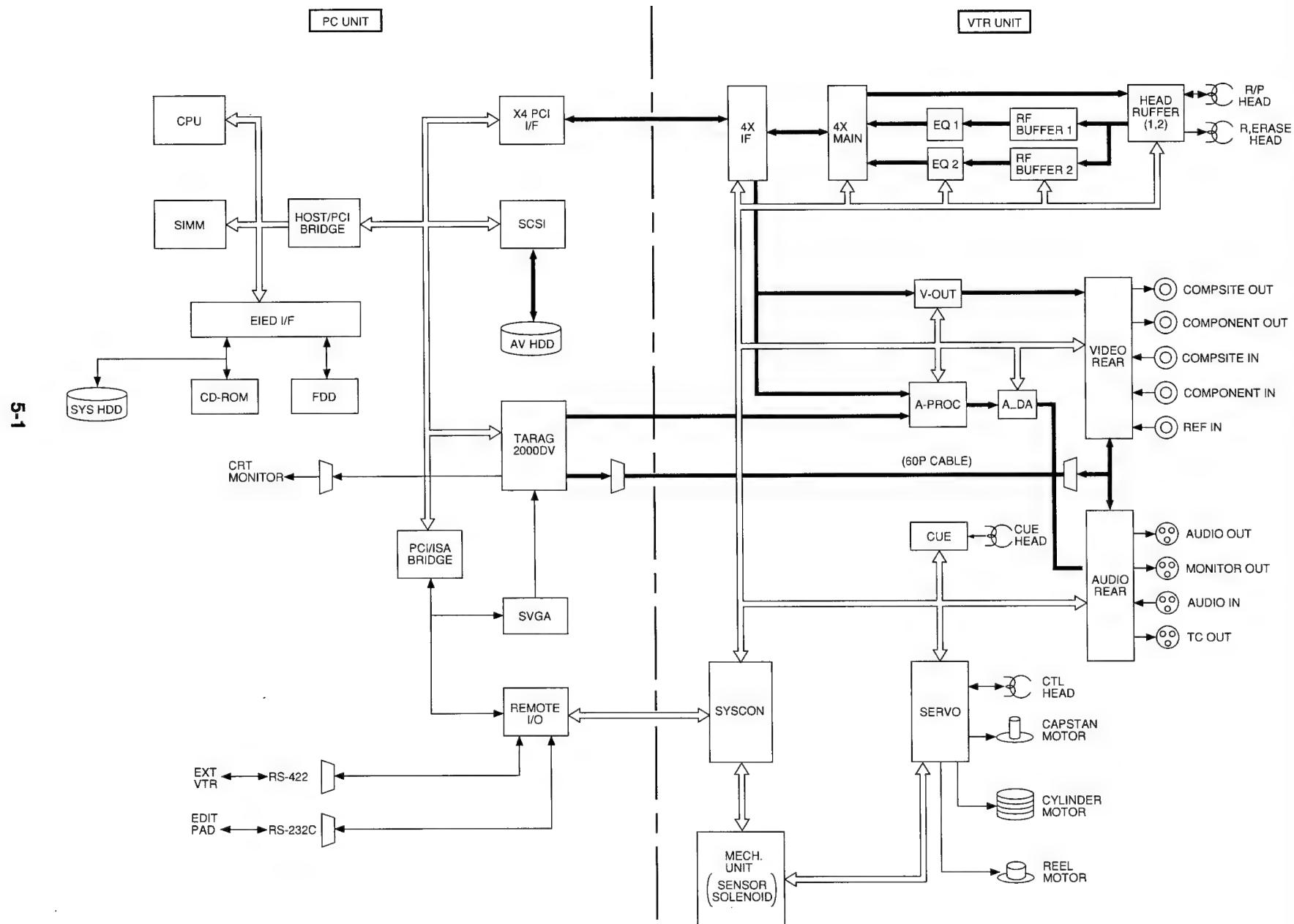
## BLOCK DIAGRAMS

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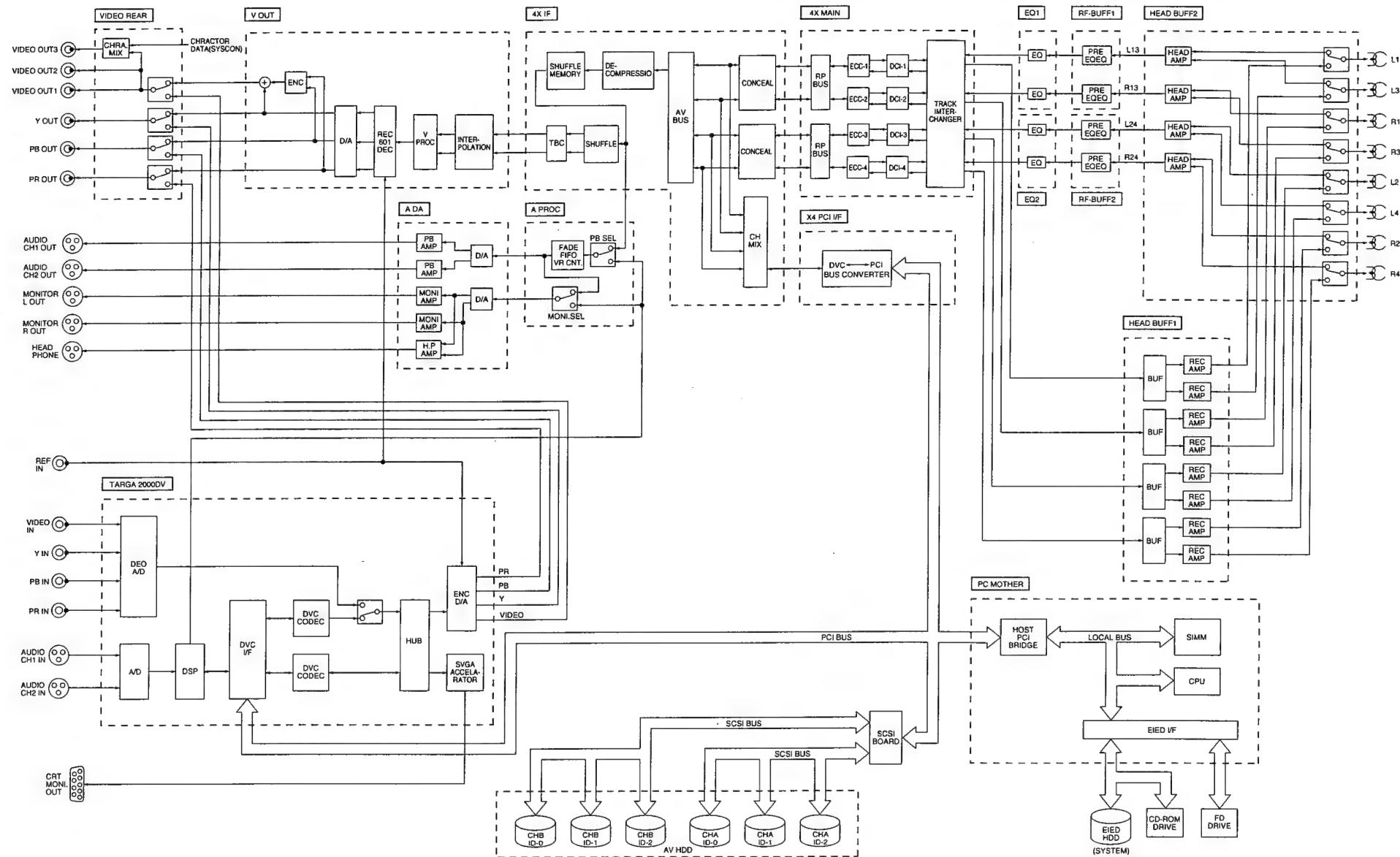
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# 1. OVERALL BLOCK DIAGRAM

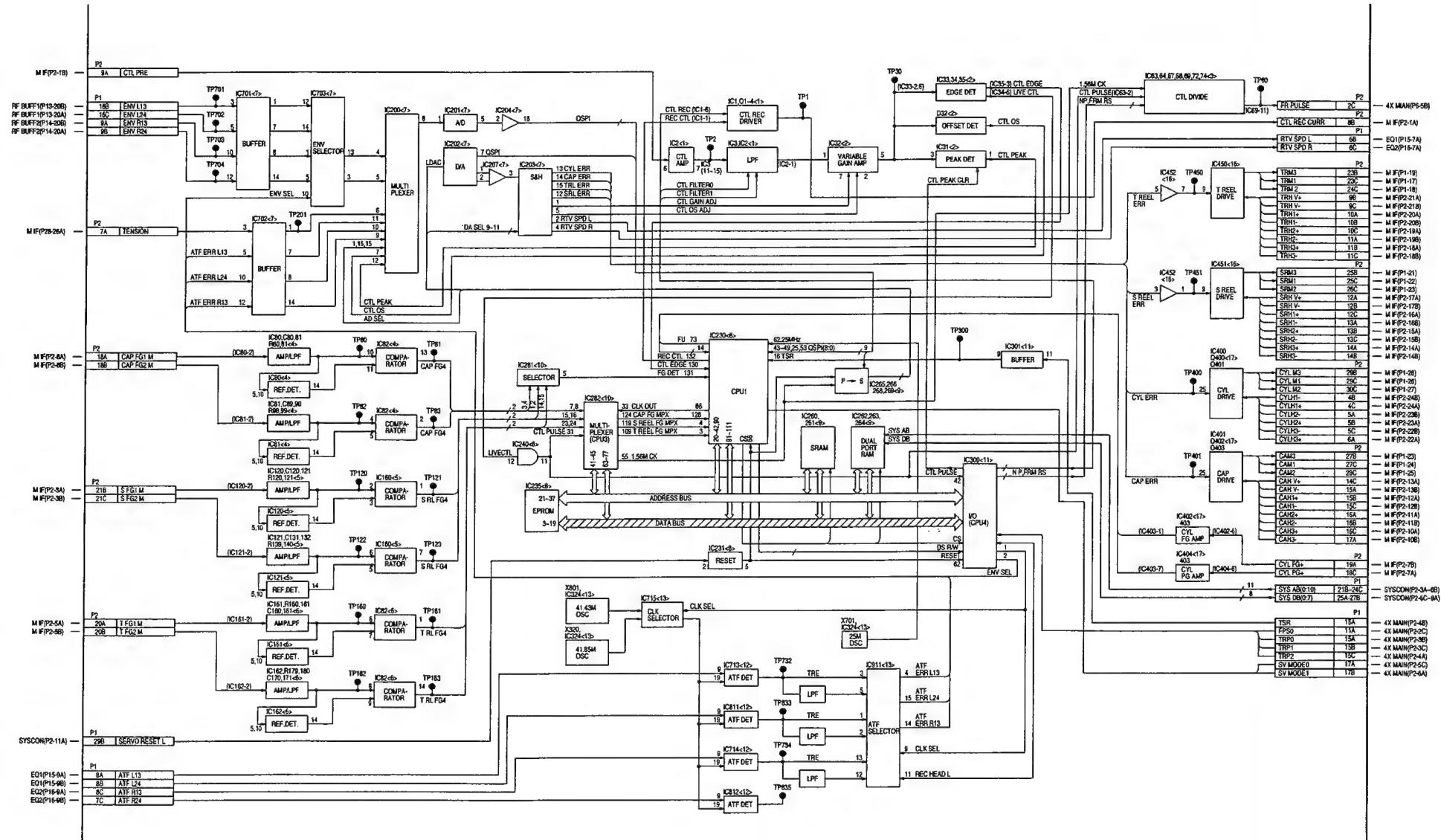


## 2. OVERALL BLOCK DIAGRAM

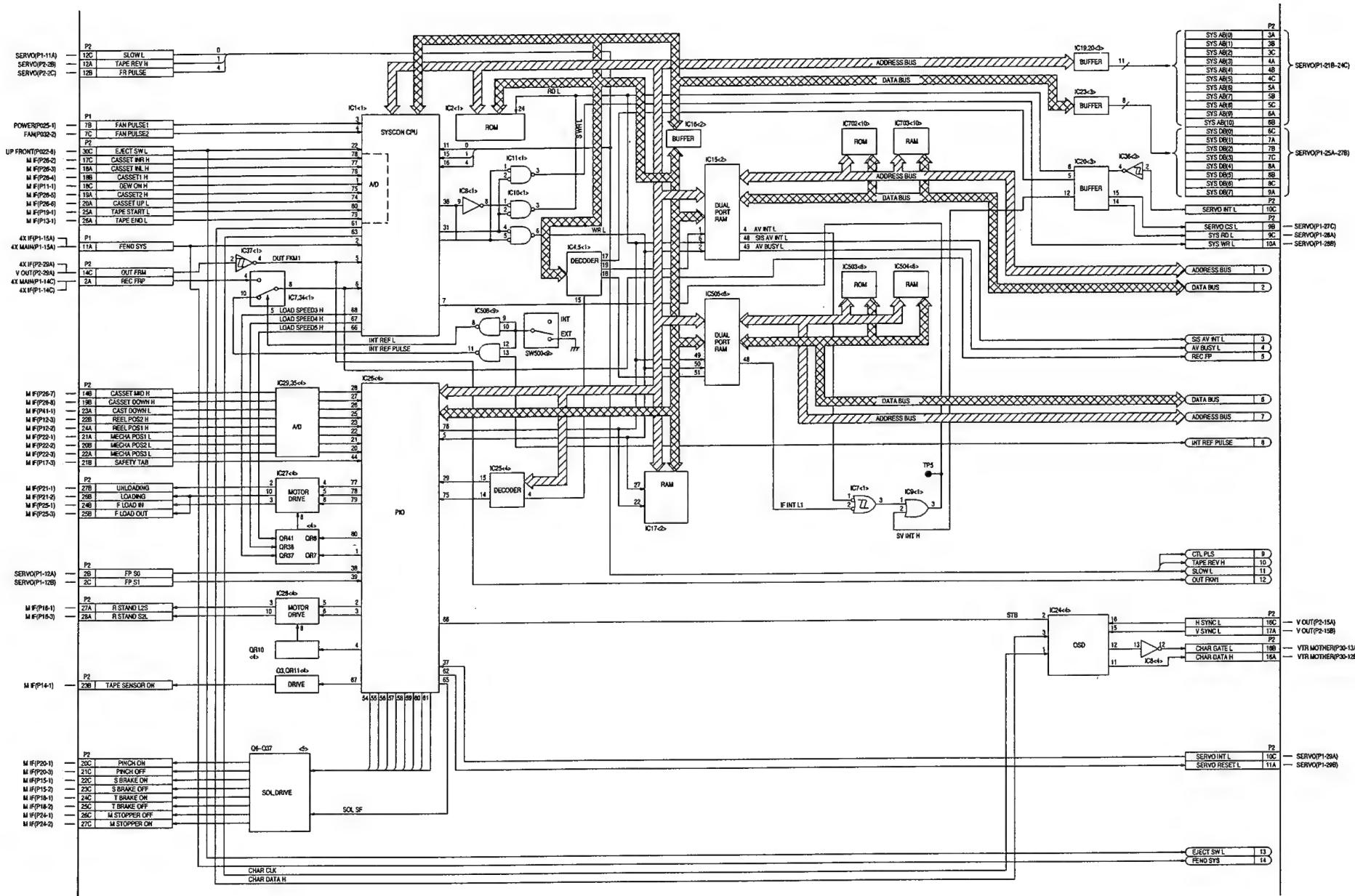
5-2



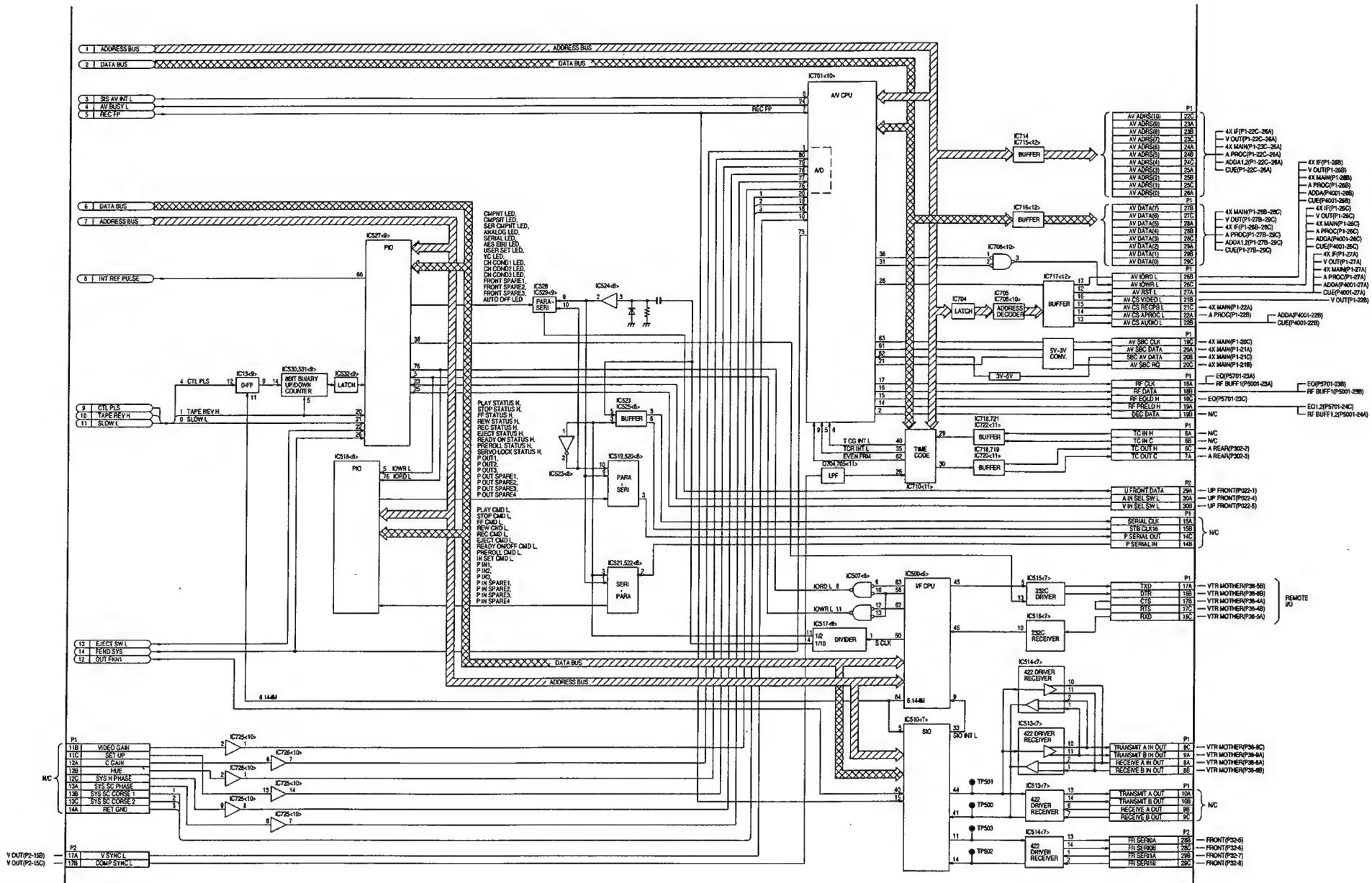
### 3. SERVO CONTROL (F1) BLOCK DIAGRAM



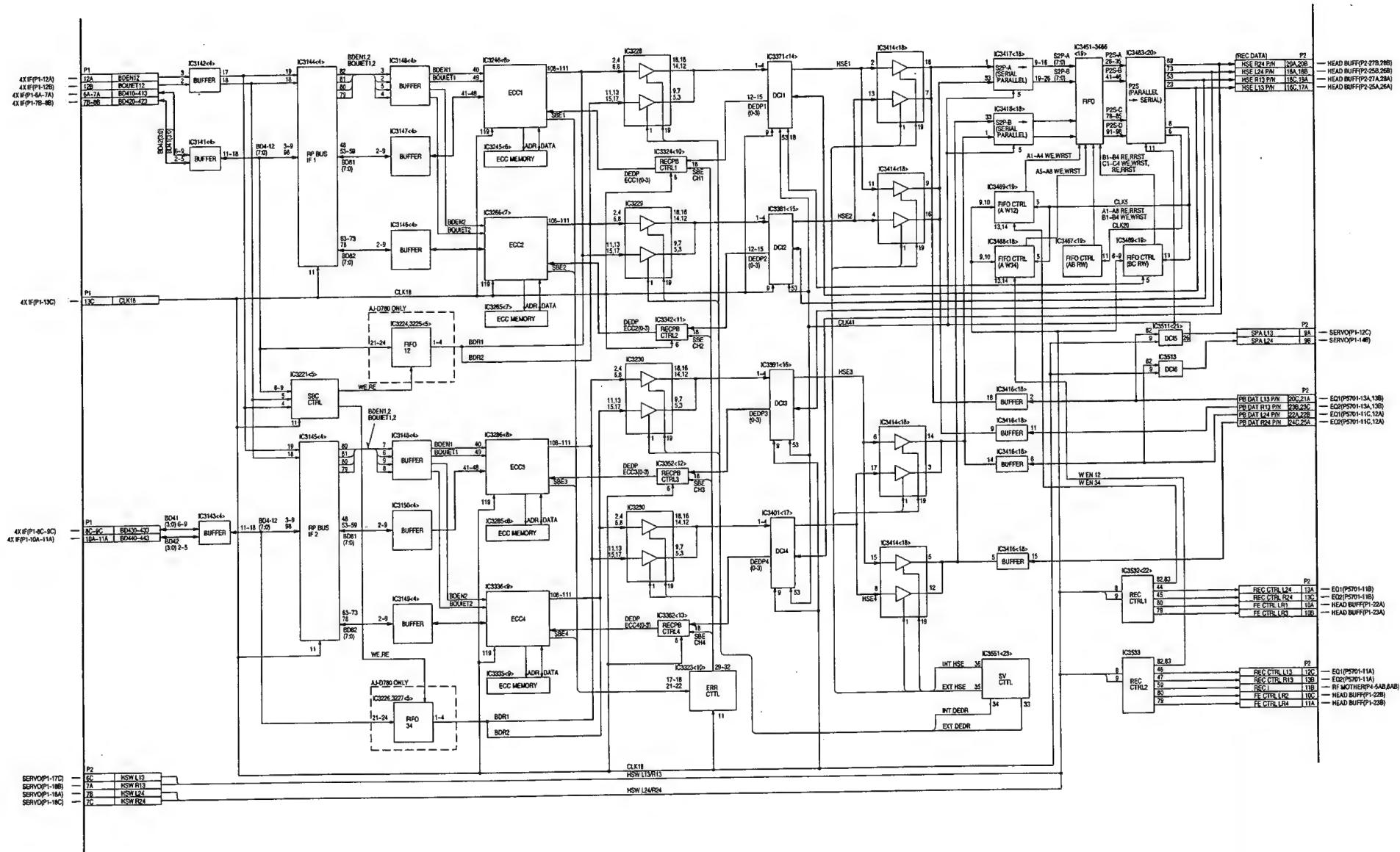
## 4. SYSTEM CONTROL 1/2 (F2) BLOCK DIAGRAM



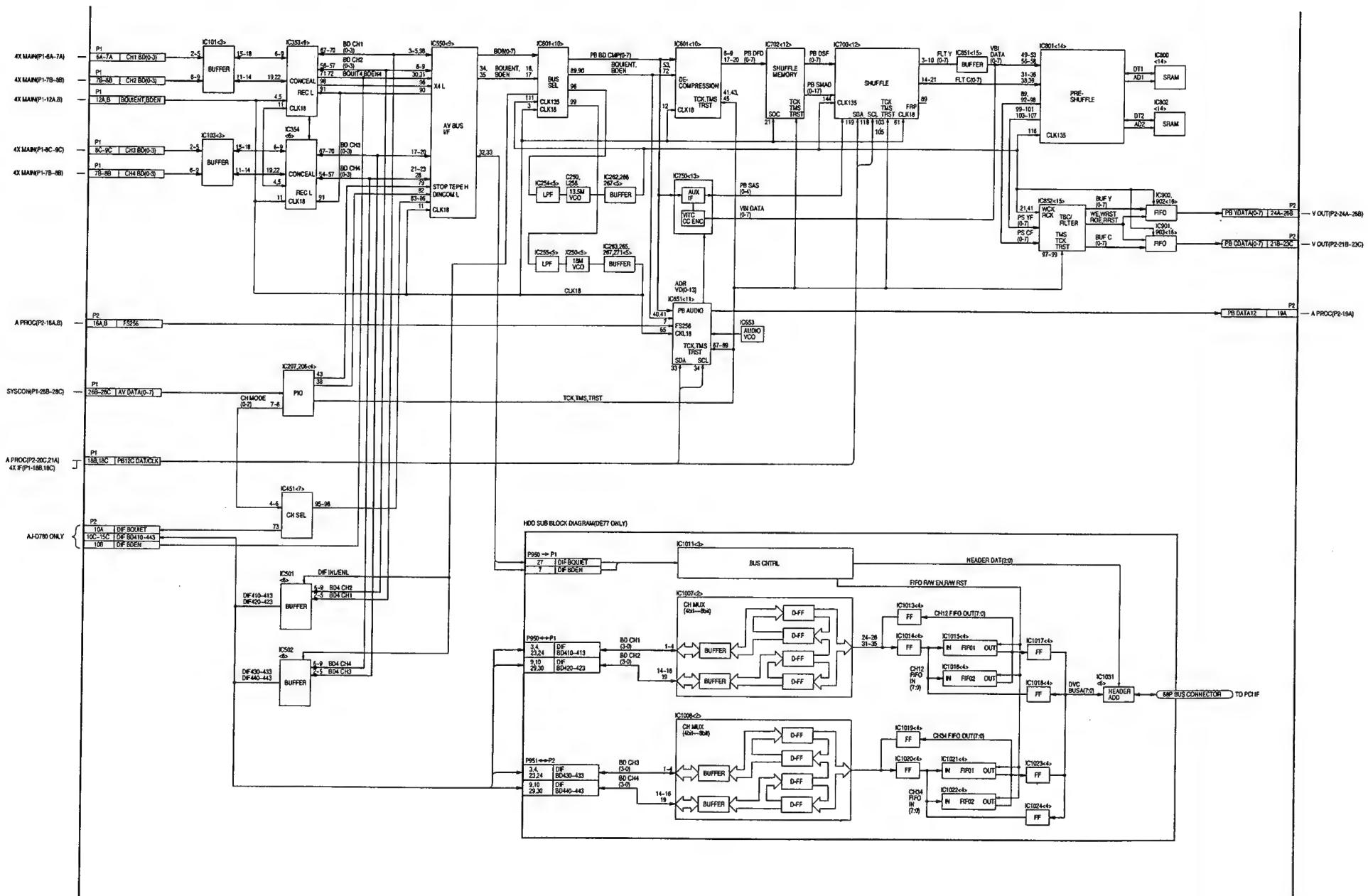
## 5. SYSTEM CONTROL 2/2 (F2) BLOCK DIAGRAM



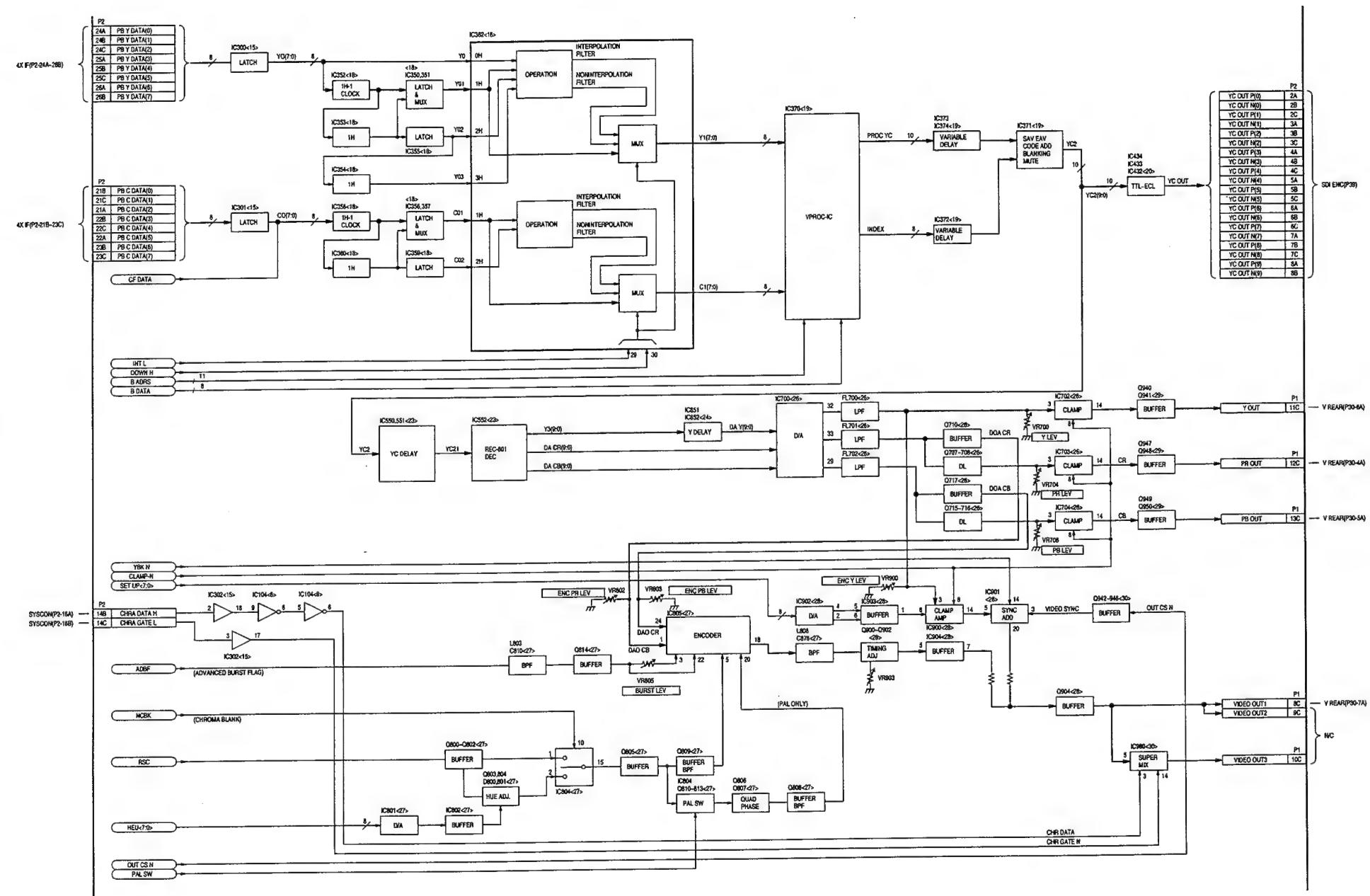
## 6. 4X MAIN (F3) BLOCK DIAGRAM



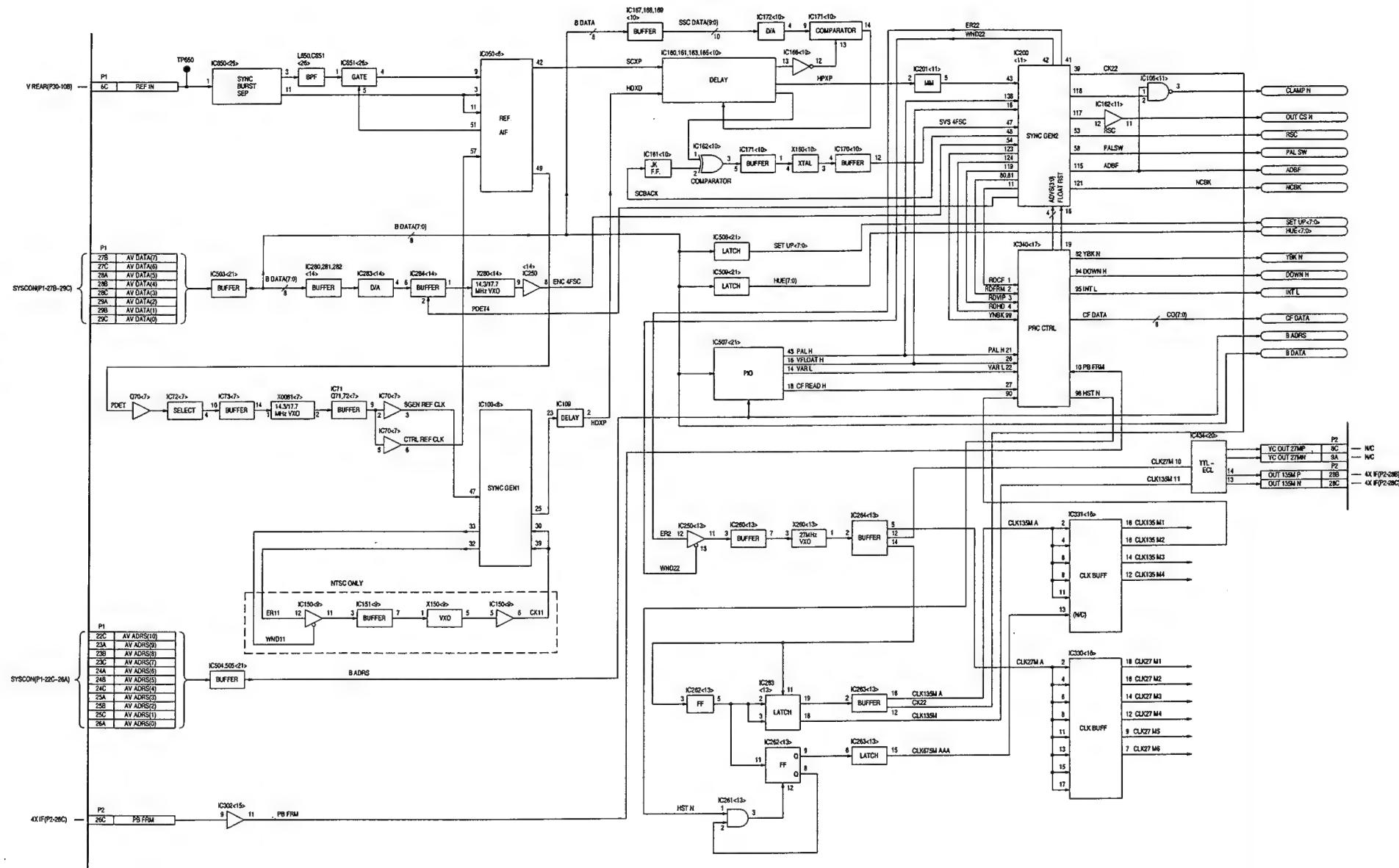
## 7. 4X I/F (F4) BLOCK DIAGRAM



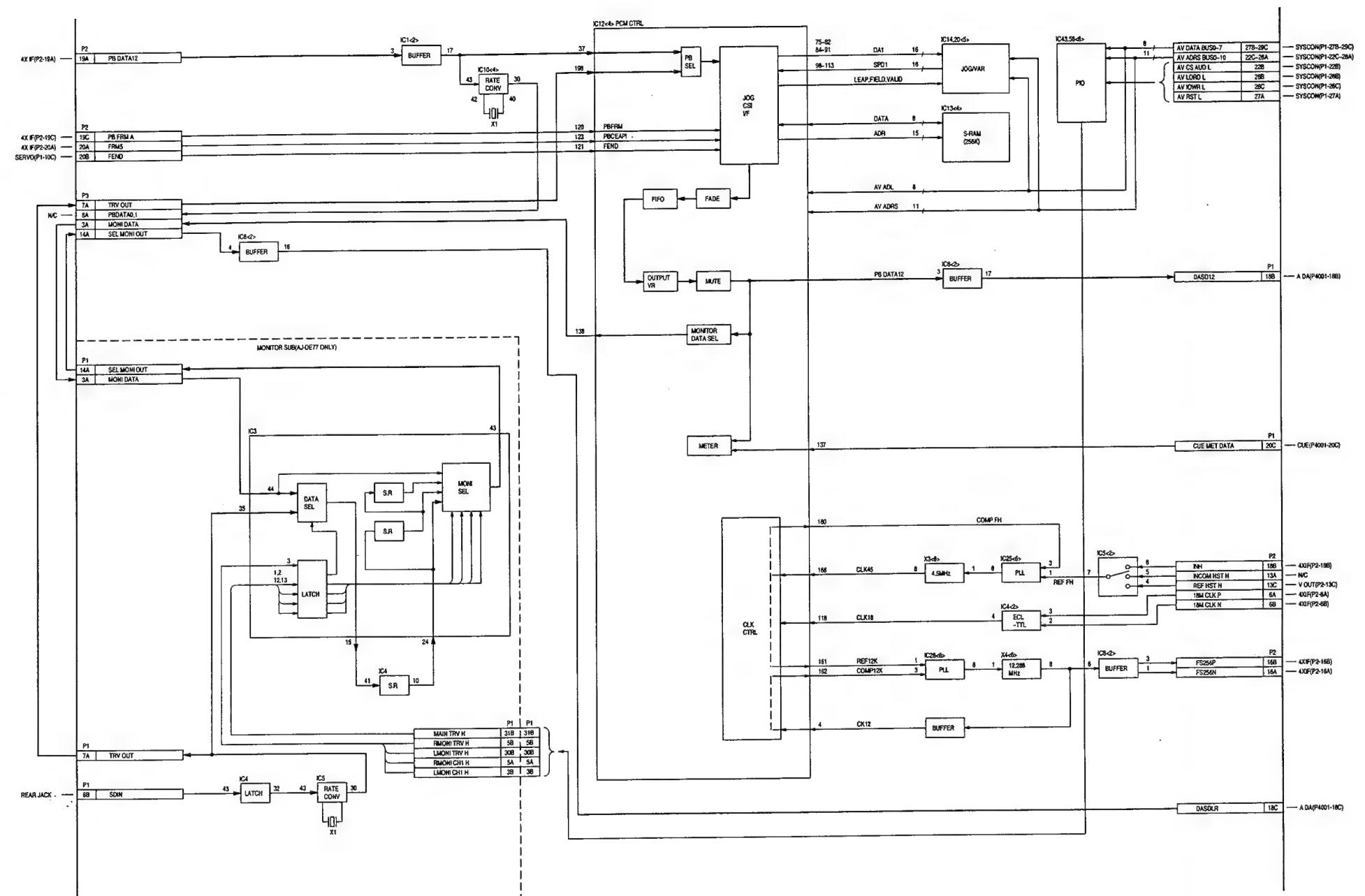
## 8. V OUT 1/2 (F5) BLOCK DIAGRAM



## 9. V OUT 2/2 (F5) BLOCK DIAGRAM

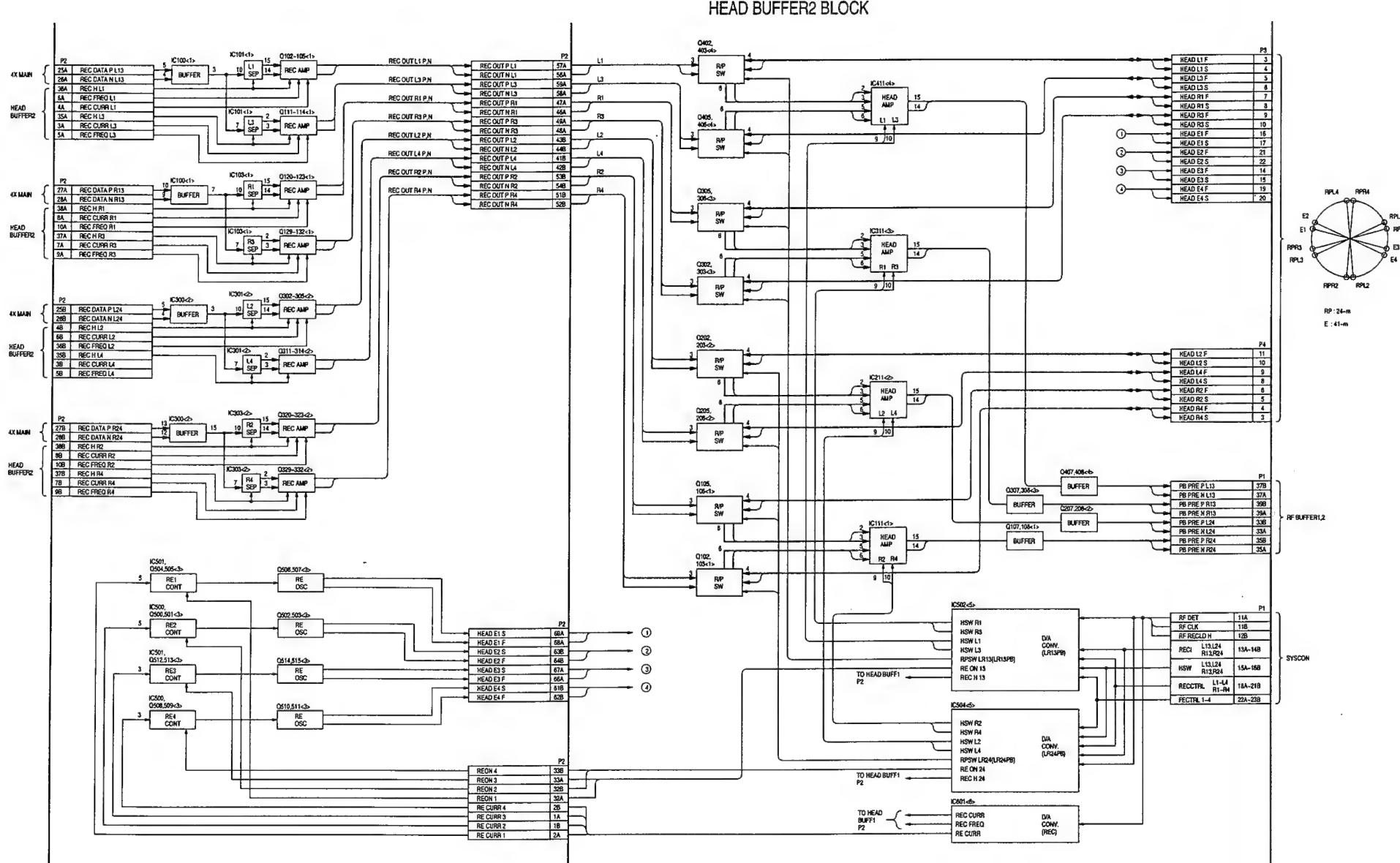


## 10. A PROC (F6) BLOCK DIAGRAM

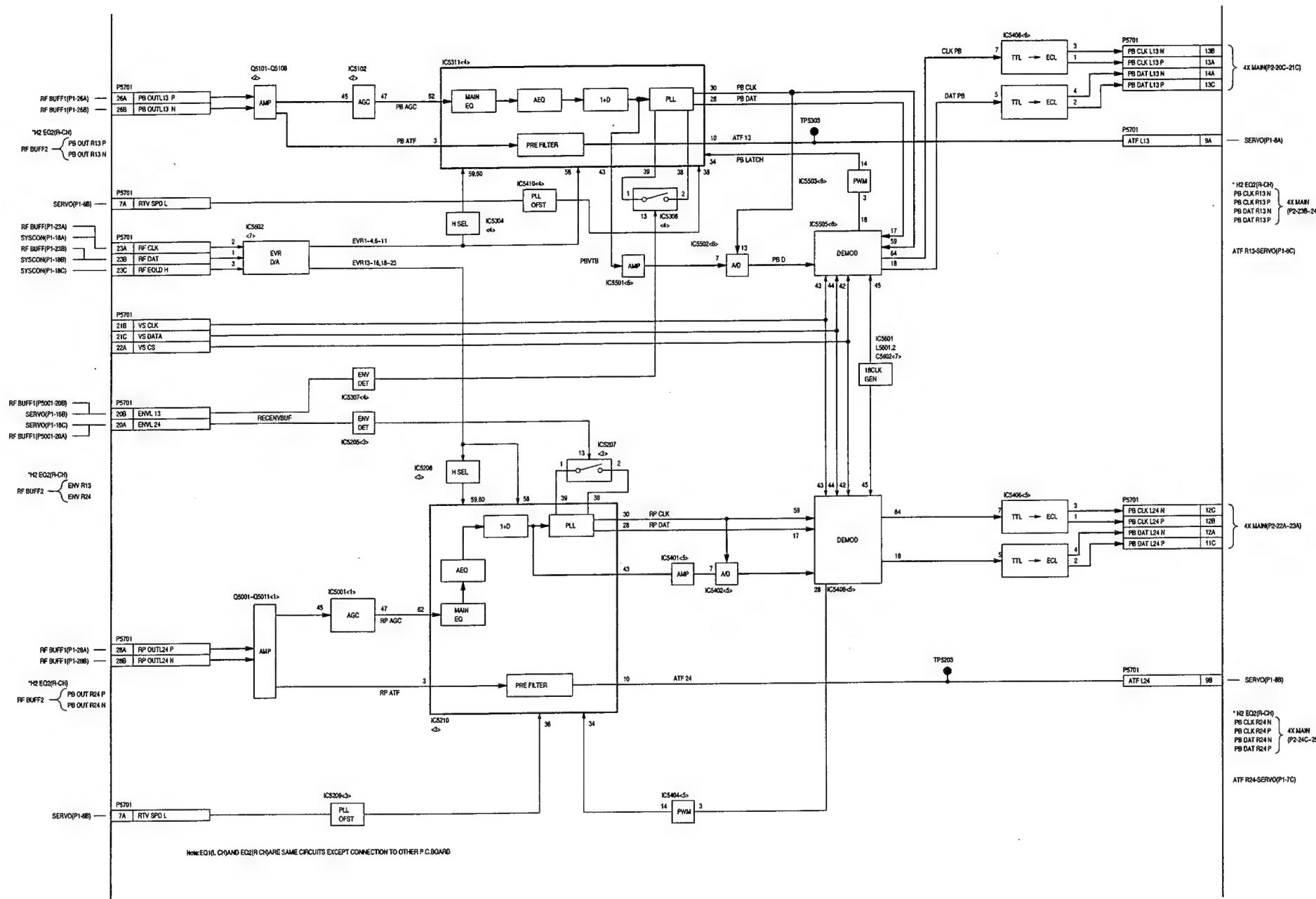


## 11. HEAD BUFFER 1, 2 BLOCK DIAGRAM

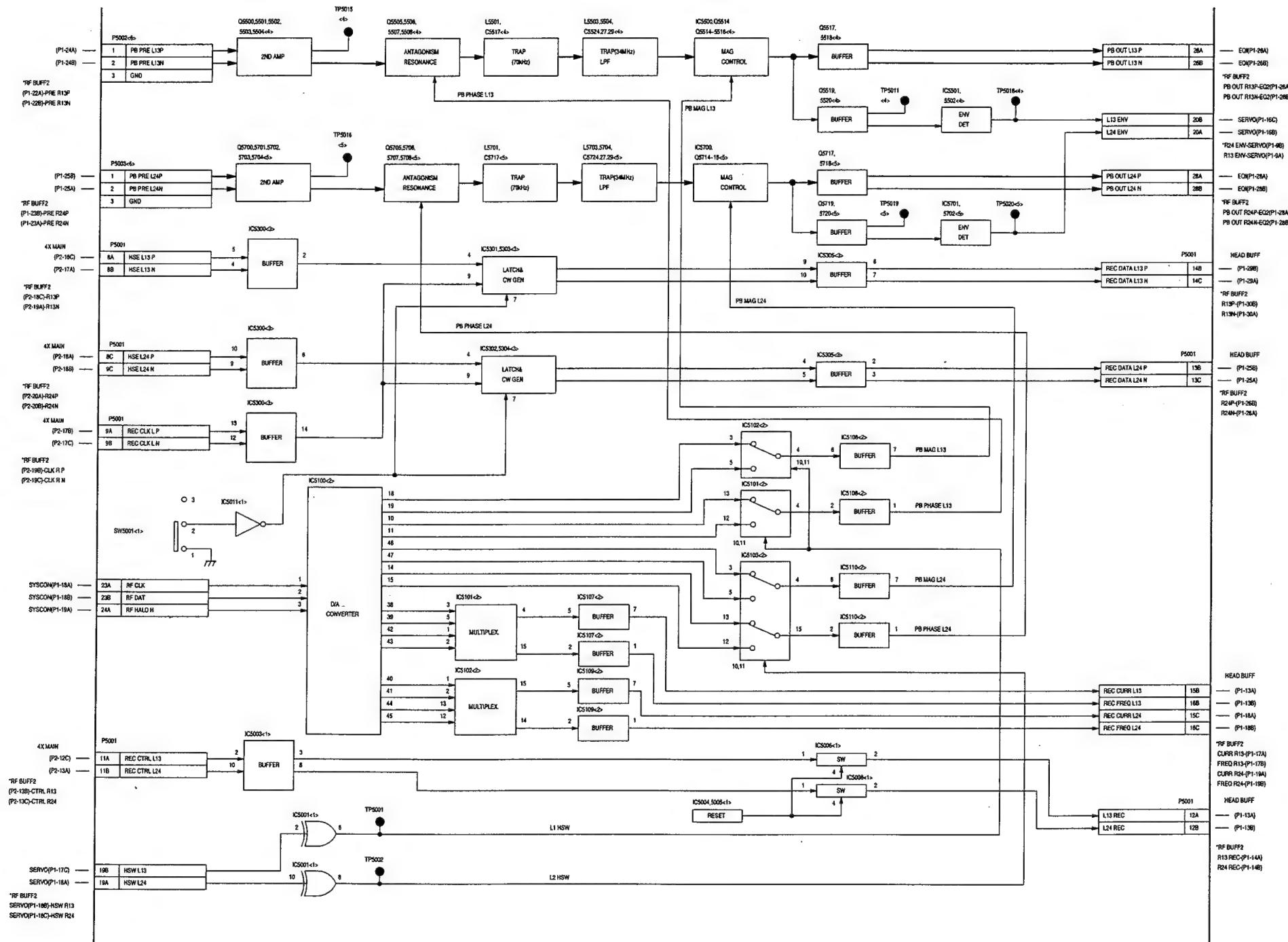
11-5



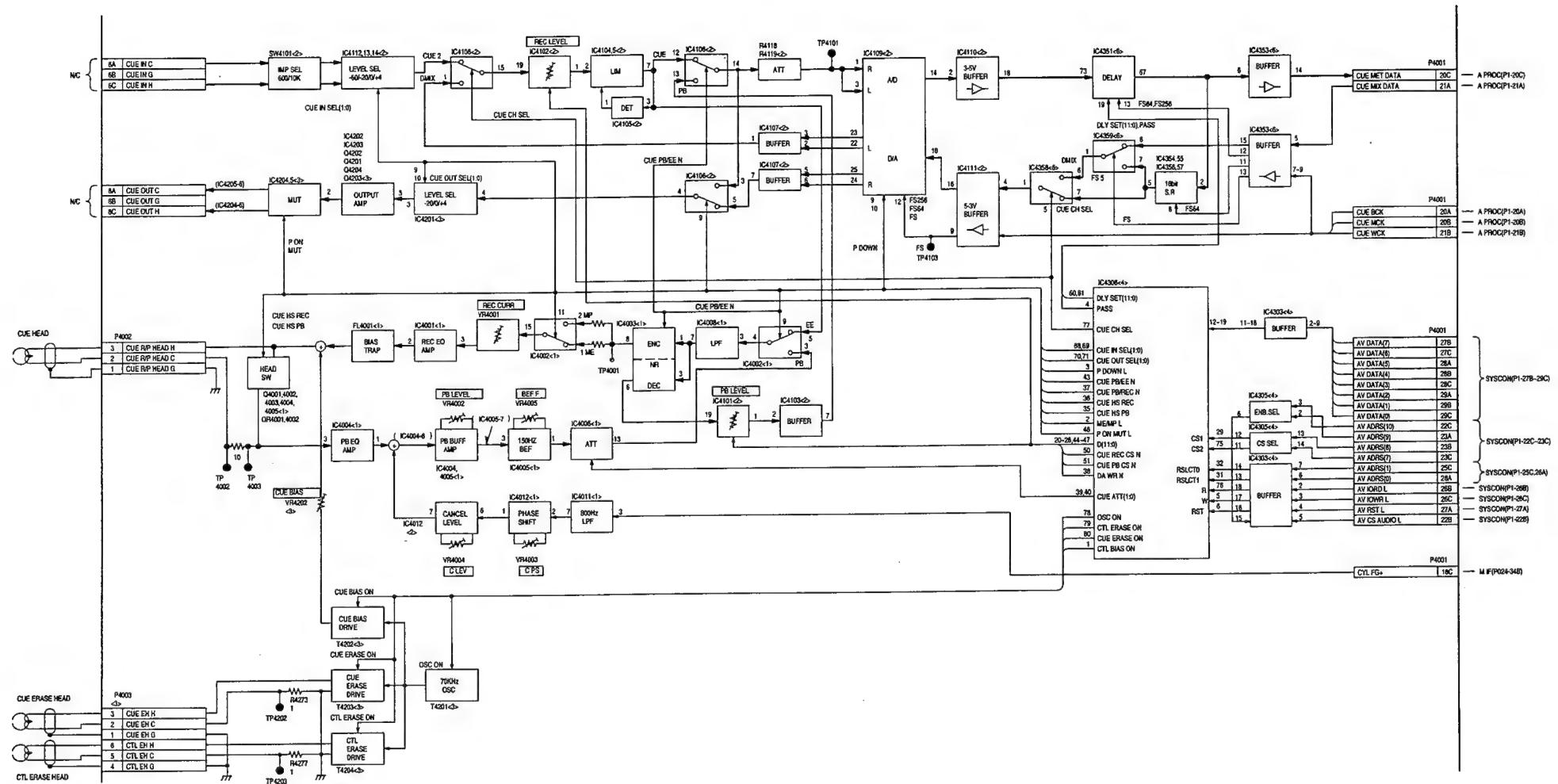
## 12. EQ 1, 2 (H1/H2) BLOCK DIAGRAM



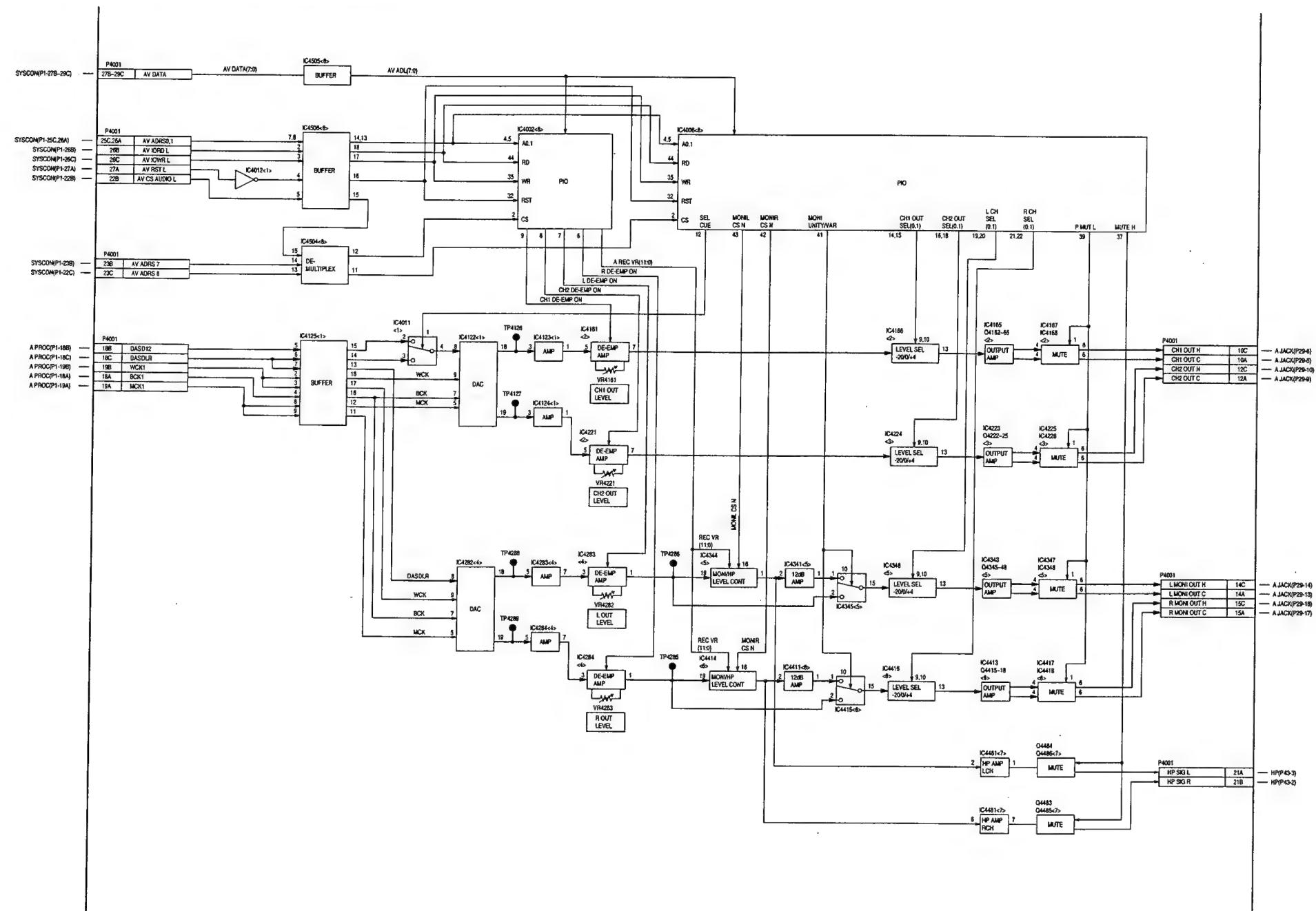
## 13. RF BUFFER 1, 2 (H3/H4) BLOCK DIAGRAM



#### 14. CUE (H5) BLOCK DIAGRAM

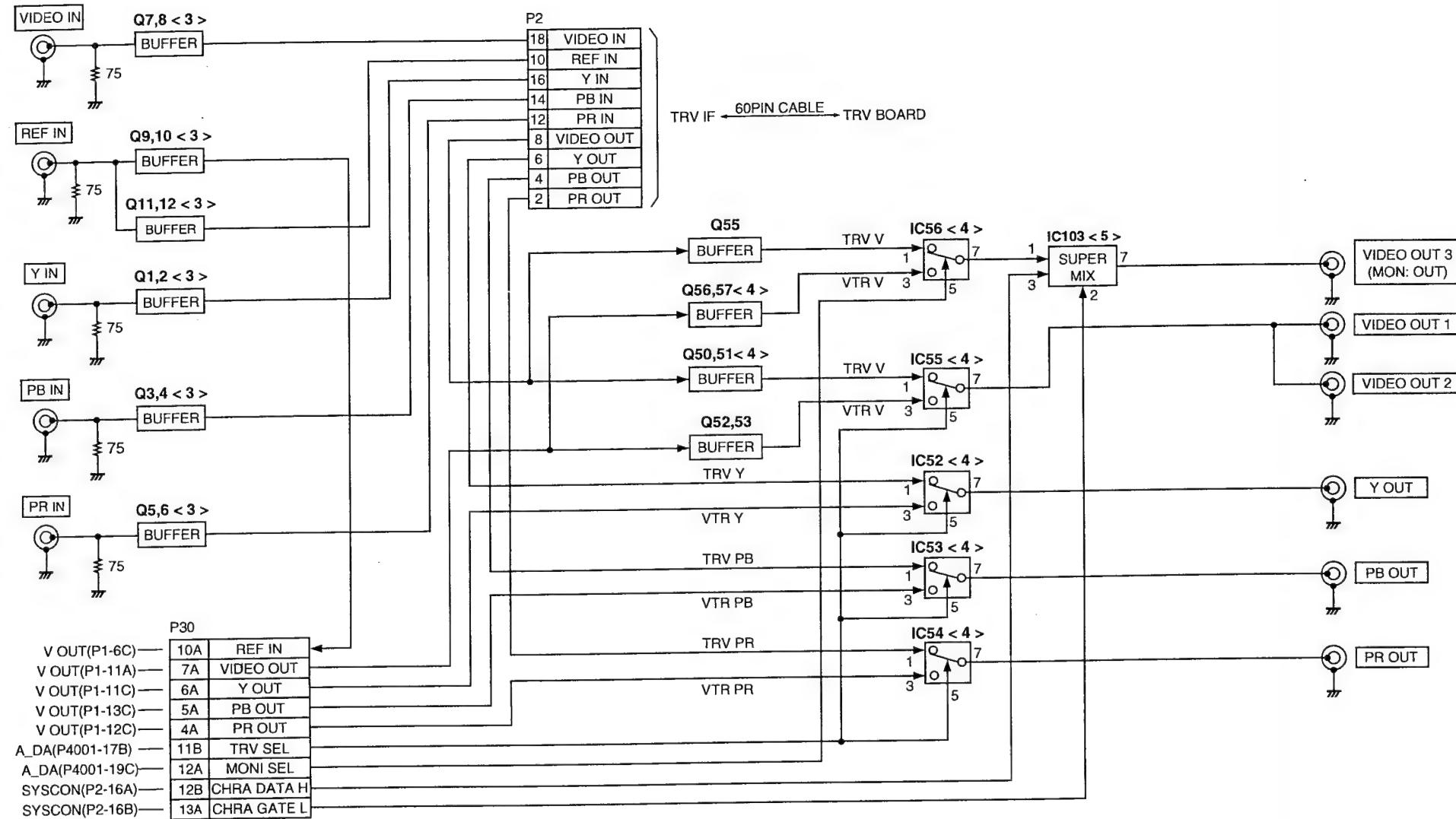


## 15. A DA (H6) BLOCK DIAGRAM



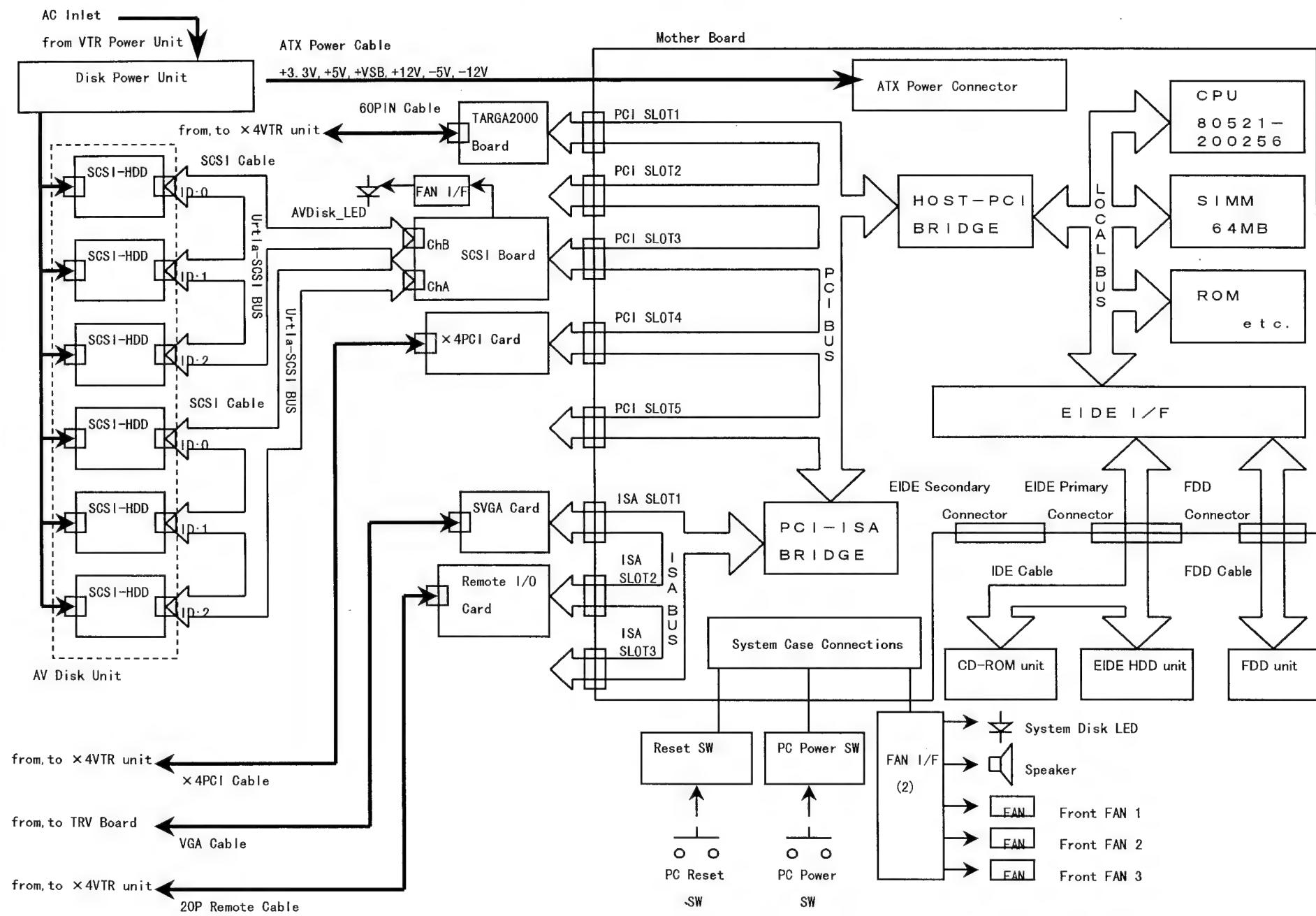
## 16. V REAR BLOCK DIAGRAM

5-16

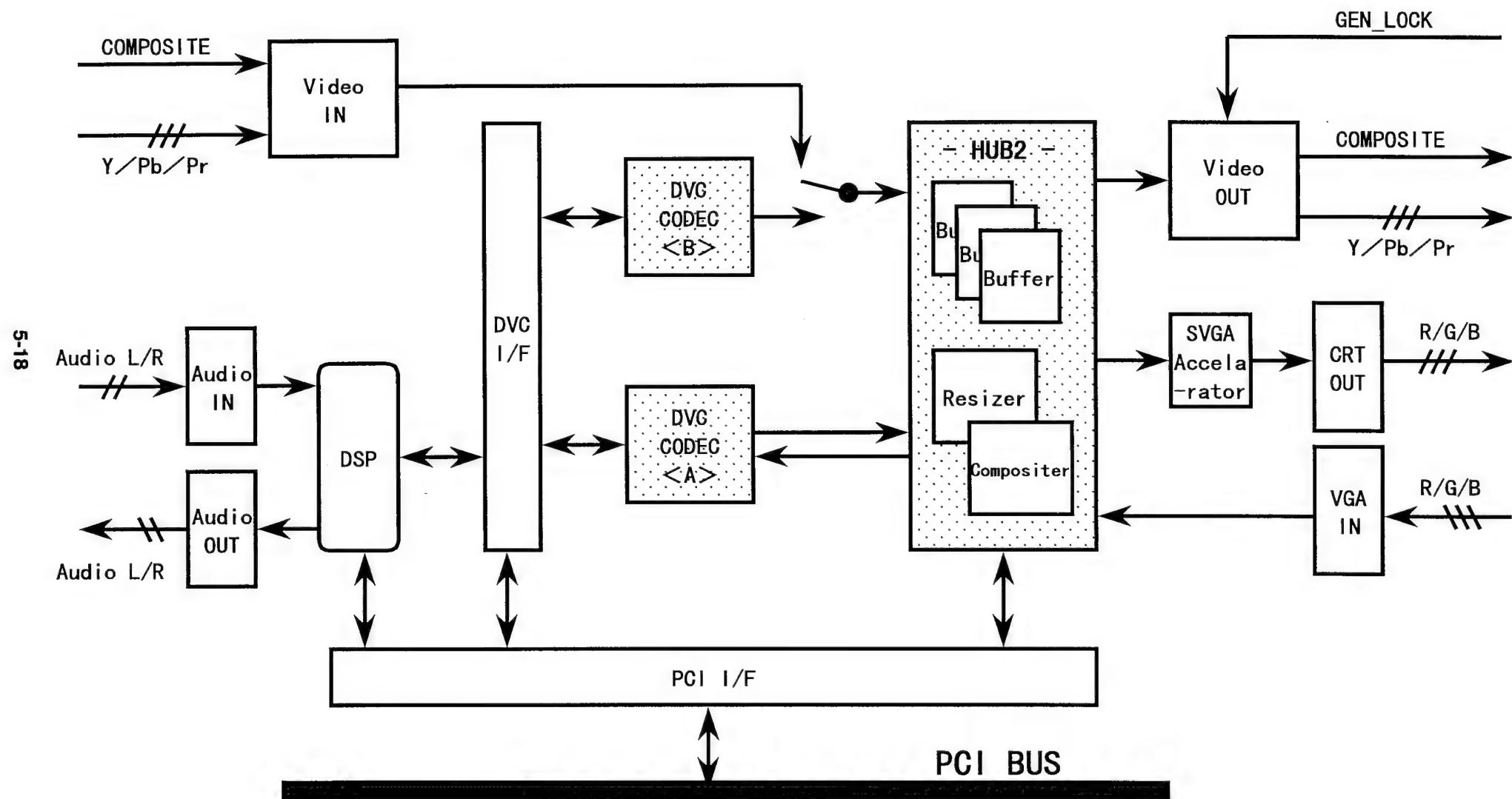


## 17. PC UNIT OVERALL BLOCK DIAGRAM

5-17

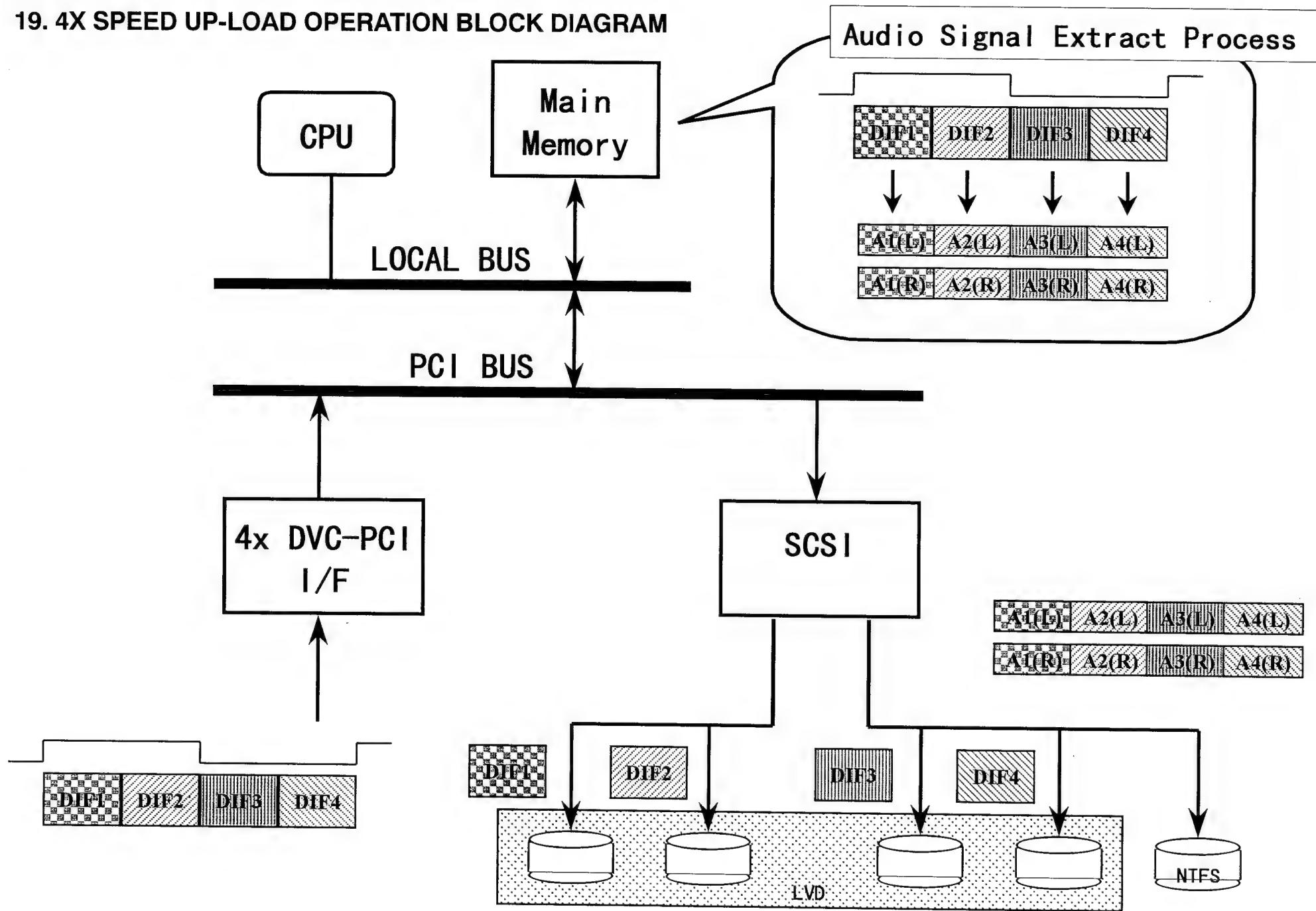


## 18. TARGA 2000DV OVERALL BLOCK DIAGRAM



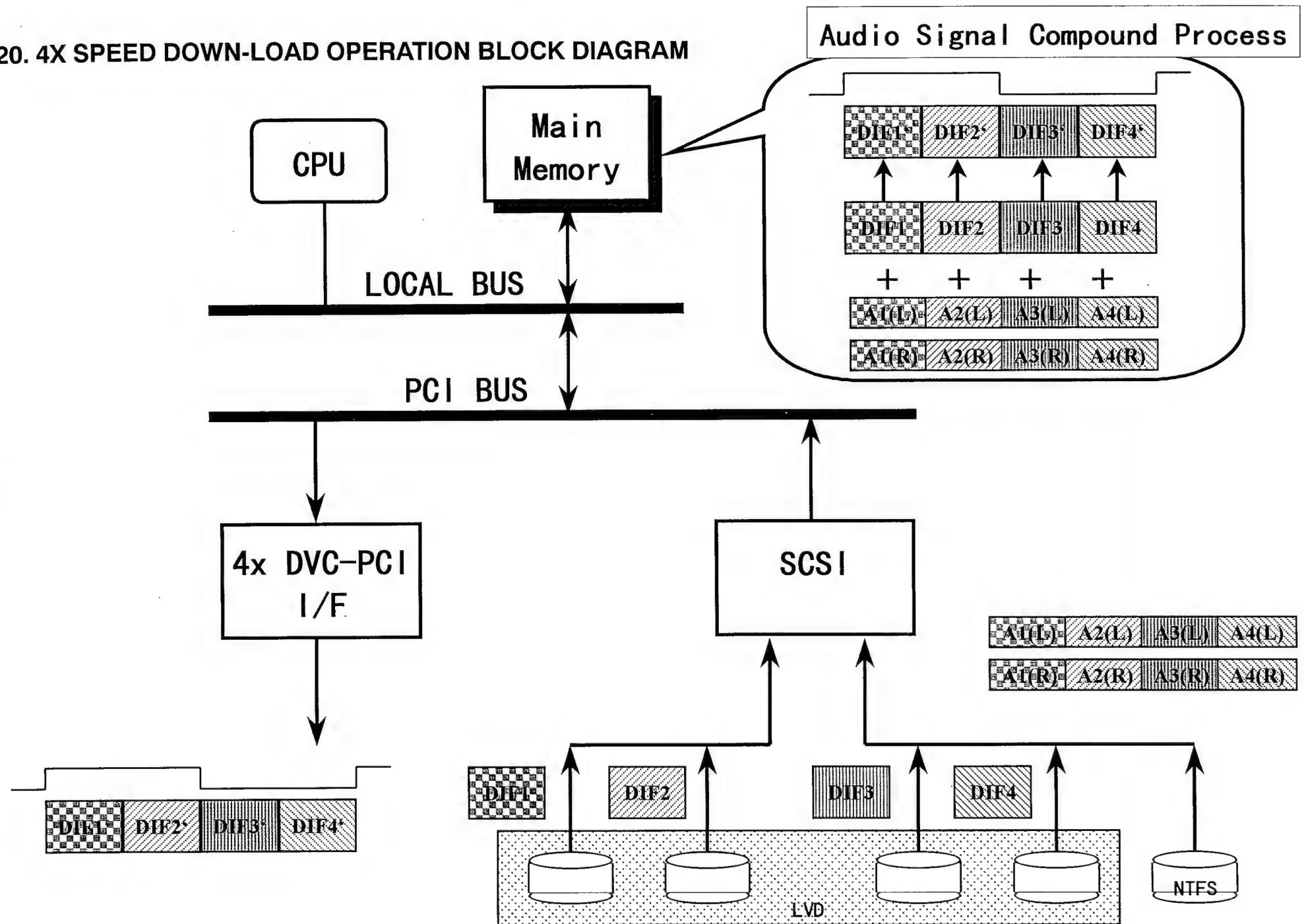
## 19. 4X SPEED UP-LOAD OPERATION BLOCK DIAGRAM

5-19



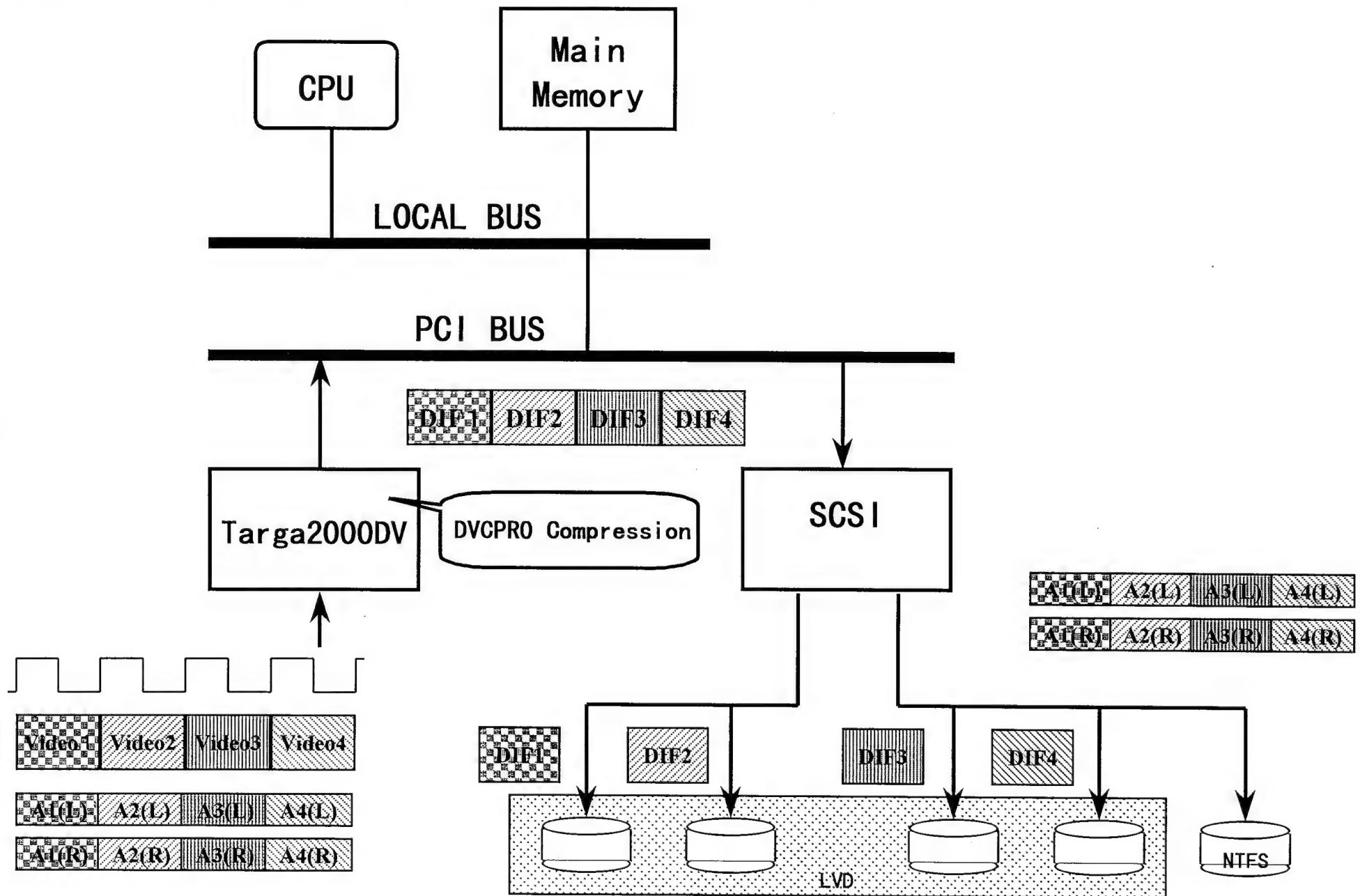
## 20. 4X SPEED DOWN-LOAD OPERATION BLOCK DIAGRAM

5-20



## 21. EXTERNAL VIDEO SOURCE UP-LOAD OPERATION BLOCK DIAGRAM

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## 22. TECHNICAL INFORMATION OF AJ-DE77

### 1. Brief explanation of the systems

The AJ-DE77 is a hybrid non-linear DVC PRO format editing system which includes a four times normal speed signal-transfer unit built in a tower case.

The AJ-DE77 consists of a 4x (four times) DVC PRO-VCR unit and a PC unit which includes an AV-HDD. DVC PRO-compressed data can be uploaded and downloaded directly between the 4xDVC PRO-VCR unit and the AV-HDD. The PC unit is constructed with a PC/AT compatible architecture. Windows NT 4.0 is adopted as the OS, and the non-linear editing in the DVC PRO format can be performed under a GUI environment with dedicated non-linear editing application software.

In addition, the AJ-DE77 PC unit is equipped with a capture-effect card on which two units of DVC PRO Codec are installed. With this card, external sources and real-time 2D effects can be captured with DVC PRO compression.

Operations are handled under the following three modes:

- ① Uploading, whereby necessary portions of material tapes are copied to the AV-HDD (at 4x speed)
- ② Nonlinear editing, whereby the playback sequence of materials on the AV-HDD is determined.
- ③ Downloading, whereby the determined AV-HDD playback sequence is recorded on a tape media. (at 4x speed)

The concept of the Non-linear editing is a imagines editing method in which the playback sequence of the material on the HDD is determined by making use of the random-access capability of the HDD. This method, unlike linear editing, does not require actual recording of material data. Because material on the HDD can be maintained without any modification, it is possible to compose multiple playback sequences using the same materials.

## 2. Outline of 4xDVCPRO-VCR unit

Whereas the cylinder rotation speed is 9000 rpm, the same as that of AJ-D750, the AJ-DE77 has a cylinder-tape transport mechanism with a tape lead angle specified for 4x speed recording/playback of DVCPRO format tape. 12 video heads (8 recording/playback heads and 4 rotary-erase heads) are mounted on the cylinder. During playback, four frames of DVCPRO compressed data on DVCPRO tape are played back in one frame period, then converted to 4x DIF signals by memory processing and transferred to the PC unit without changing the DVCPRO compression data format. During recording, the 4x DIF signals received from the PC unit are recorded on tape in DVCPRO format. Because all data is transferred with the PC unit in the DVCPRO compressed data format, there is no image quality degradation which would otherwise occur through data compression and decompression. In addition, the 4xDVCPRO-VCR unit can utilize its memory processing capabilities to playback pictures at normal speed (x1) for monitoring.

### (1) 4x\_MAIN Process

During 4x speed playback, 4 channels playback signals and clocks output from the RF amplifier are input to the Track Inter-Change block circuit (TRACK INTERCHANGE BLOCK).

The TRACK INTERCHANGE BLOCK converts the track order of the playback signals to the same order as the normal playback of original DVCPRO format and outputs them to the DCI LSI.

The modulated signals converted to the regular track order are demodulated by the DCI LSI and input to the ECC LSI.

The ERR\_CTRL PLD converts the mixed error rate of the 8 heads to individual error rates for the L1 head, R1 head, etc. and sends this error information to the system controller via the microcomputer bus line.

The ECC LSI corrects the input signal errors and sends the signals to the 4x\_IF board.

During x1 speed playback, the 4-channel playback signals and clocks output from the RF amplifier are input to the TRACK INTERCHANGE BLOCK, where the four signals are combined to one signal, converted to the same regular order as the normal playback of normal DVCPRO format, and output to the DCI LSI. Then, the signals are processed in the same manner as with 4x speed playback and output to the 4x\_IF board.

During 4x speed recording, the ECC LSI adds parity bits for error correction to the recording signals from the 4x\_IF board and outputs the signals output to the DCI LSI. The DCI LSI then modulates the signals in accordance with the DVCPRO format and adds sequence numbers and pilot signals.

The recording signals output from the DCI LSI are converted in the TRACK INTERCHANGE BLOCK so that the regular track order is recorded on tape and then output to the RF amplifier.

## (2) 4X I/F Process

4 channels of DVC standard bus outputs from the 4xMAIN board are input to the CONCEAL PLD.

During the 4x signal-transfer, the playback data from each channel are input every four-frames to the error correction circuit. Therefore, the sync-block which have not been corrected an error, that corrected with the four-frame prior data. The CONCEAL PLD handles this matter; the CONCEAL PLD is detected the sync-block that has been corrected by the ECC LSI and then concealed by the adjacent channel signals.

The DVC standard bus signals output from the CONCEAL PLD are input to the AV BUS IF and PB AUDIO LSI, and DE-COMPRESSION LSI.

The AUDIO LSI demodulates audio data from input standard bus signals of channel 1 and outputs them to the A\_PROC board.

The HDD SUB BLOCK time-multiplexes the 4-channel DVC standard bus signals to an 18-Mbps data signal and outputs this signal to the PCI interface processor of the PC side .

## (3) VIDEO REAR Process

[Input part]

The input signals (component and composite) from the BNC on the rear panel are input directly to the TARGA2000DV board via external D-sub 60Pin cable.

[Output section]

The signals output from the TARGA2000DV enter the Video Rear board via external D-sub 60Pin cable. These signals and the VCR output signals are switched, and the switched signal is output from the output BNC on the rear panel. The output selection is made to the signal that has been made active on the GUI display.

## (4) AUDIO REAR Process

- (a) Outputs the time-code, analog audio (CH1/CH2), and audio monitor out (L/R), through the built-in VTR Mother.
- (b) Outputs AES/EBU 4-channel signals after converting the unbalanced output of the built-in VCR mother to a balanced one. (Option)
- (c) Inputs analog audio (CH1/CH2) to the Targa2000DV board.

### 3. PC unit outline

#### (1) CPU

Pentium-PRO made by Intel has been adopted as the main CPU of the PC unit. It has an operational frequency of 200 MHz and features a 256-Kbyte secondary cache memory.

Pentium-PRO with the stored secondary cache can read/write with the same operational clock speed as the CPU, and delivers high-grade performance ideally suited for the full 32-bit OS of Windows NT, providing stress-free non-linear editing operations under the GUI environment.

#### (2) Main Memory

The Main Memory comprises two units of 32-Mbyte 72-pin SIMM (Single Inline Memory Module) on which EDO (Extended Data OUT) DRAM with access-times of 60nsec are mounted. The data bus length of the SIMM is 32 bits, whereas that of the Pentium-PRO is 64 bits, so two SIMMs are installed as one unit of memory.

The EDO RAM is devised so that its data can be accessed even after the CAS (Column Address Strobe) signal has become inactive, leading to a longer read-out than that of a high-speed page DRAM. Thus, the period of the CAS signal and the read-out time for consecutive data can be shortened.. The EDO RAM is particularly effective with the AJ-DE77 where sequential long video data is processed.

In the Windows NT environment, at least 32 Mbytes of memory resource is recommended. With insufficient memory, memory swapping with virtual memory allocated to the HDD occurs and the overall operational speed drops considerably. With the AJ-DE77, a total 64 Mbytes of memory is installed, providing comfortable non-linear editing operations under the GUI environment.

#### (3) Mother Board

The P/I-P6NP5N Mother Board, Its layout format is the Intel recommended ATX format. This Mother Board is well-suited for the AJ-DE77 which needs to install long cards on it, because the ATX format does not allow microprocessors to be put at the rear of the extension-slots. There are four PCI-slots, one shared PCI/ISA slot, and two ISA (Industrial Standard Architecture) slots.

The PCI chip set, whose main application is the transfer of data on the PCI bus, has three Intel44FXs mounted on it. The Intel44FX complies with the most recent version Ver 2.1 of the PCI bus standard set by PCI SIG (Peripheral Component Interconnect Special Interest Group) and. The PCI bus is a high-speed bus with 33 MHz operational clock speed 32 bits address/data bus length and 132 Mbits/sec maximum transfer rate. It can dependably transfer the DVCPRO compression data stream (120 Kbit/frame) at 4x speed.

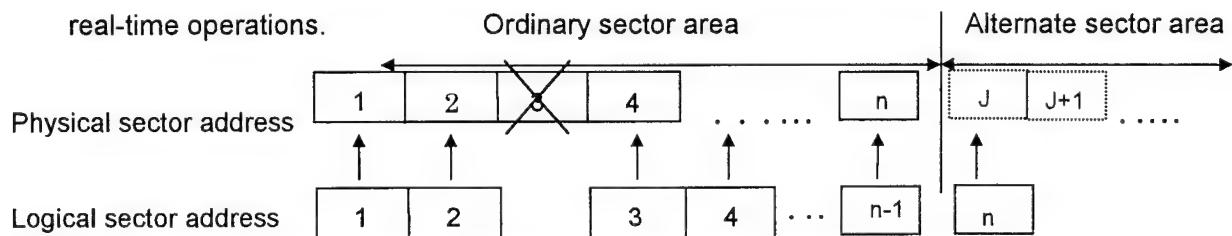
#### (4) System Disk

The System Disk, a Western Digital with an enhanced IED connection has been adopted. It is a high-performance HDD using thin-film heads. It features 1.6 Gbyte capacity, 5200 rpm revolution speed 12 msec average access-time, 128 Kbytes buffer-size ; and 40~50 Mbit/sec internal-media transfer-rate. The PRML(Partial Response Maximum Likelihood) method has been adopted for signal modulation. This method, unlike conventional methods which detect peak values of read-out signals over a threshold, demodulates signals from their waveform pattern. The PRML method can generally increase the recording density by about 20% .

The unit supports PIO (Programmed I/O) mode 4 with the maximum transfer-rate of 16.7 Mbytes/sec and multi-word DMA (Direct Memory Access) mode 2 for the data transfer. The AJ-DE77 uses the Intel440FXs in the multi-word DMA mode, easing the load on the CPU. The System Disk is master-connected to the primary IDE I/F on the Mother Board.

#### (5) AV-HDD

With the AJ-DE77, 6 units of Western Digital's Enterprise 4360 , which has a single-ended ultra-wide SCSI I/F are installed to record and playback AV data. This HDD is a high-performance HDD with 4 disks and 8 thin-film heads, 4.36 Gbytes capacity, 7200 rpm revolution speed; 8 msec average access; 1 Mbyte buffer-memory size, and 83 to 140 Mbit/sec internal-media transfer-rate. The unit uses embedded-servo which does not cause thermal-calibration which hampers real-time operations: The slip sector method is used for alternate sector setting. When a defective sector occurs, the alternate sector is set at an adjacent area, leading to efficient seek times and speedy real-time operations.



Three HDD units are connected to the A port and three units are connected to the B port of the SCSI bus of the AHA-3940AUWD SCSI host-adapter card. Two units on the A-port SCSI-bus and the two units on the B-port SCSI-bus make a striping in the original format and record/playback Video data. The remaining unit on the A-port, formatted on NTFS, records and plays back Audio and Title data.

## **(6) Truevision Targa2000DV Card**

Targa2000DV Card is inserted in PCI SLOT#1 on the Mother Board.

It is a capture/effect card on which two units of DVCPRO Codec are installed. It can capture DVCPRO-compressed images from external sources and is capable of producing real-time 2D effects. The HUB2, through which data are input and output is the heart of the Targa2000DV. On the HUB2, effect-components are installed, such as the Britter that produces wipe, dissolve, etc., and the Resizer that provides the picture in picture capabilities. DSP is also installed for Audio processing.

In addition, an SVGA accelerator is mounted on the Targa2000DV board. It can provide a GUI display with the maximum resolution of 1152 x 870 pixels and enables video signal overlaying for CRT displays.

## **(7) SCSI Card**

A SCSI (Small Computer System Interface) host-adapter card, the AHA-3940AUWD, is installed in PCI SLOT#3 on the Mother Board. The SCSI card, working as the master device in the PCI bus, is provided with a local PCI bus which is connected to the Host PCI bus via the PCI-PCI bus bridge. Connected to this local PCI bus are two SCSI controller units which control the Ultra Wide SCSI bus on the A and B ports respectively.

One ultra-wide SCSI bus has a maximum transfer-rate of 40 Mbytes/sec with a bus length of 16 bits, and the Host System can expect the maximum transfer-rate of 80 Mbytes/sec. A maximum 16 SCSI devices, including a host adapter, can be connected to one ultra wide SCSI bus. These SCSI devices are identified by SCSI-ID (0~14), whose priority order is a little bit irregular: ID7→ID6→…→ID0→ID15→ID14→…→ID8. ID7 is usually allocated to the SCSI host adapter card.

## (8) 4xDVC-PCI I/F Card

A 4XDVC-PCI I/F card is installed in PCI SLOT#4 on the Mother Board.

This card transfers the DVCPRO-compressed signal stream at 4x speed both-ways between the PC unit and the 4xVCR unit. In the PC unit it functions as the PCI bus master device and can transfer the DVCPRO-compressed signal stream (DIF signals) at 4x speed between the Main Memory and itself by DMA-transfer.

The PCI controller controls DMA-transfer on the PCI bus and issues transfer commands to the DVC controller. The DVC controller detects and executes the transfer commands received from the PCI controller.

While uploading, this card works as follows:

- (a) Stores 4x speed DVC signals from the 4x-transfer connector (transfer bus A) in a two-frame buffer. Transfers them every one frame from the two-frame buffer to a bi-directional FIFO.
- (b) Sends them out from the bi-directional FIFO under the control of the PCI controller.

While downloading, it works as follows:

- (c) Stores DVC signals from the PCI connector in the bi-directional FIFO under the control of the PCI controller.
- (d) Transfers them every one frame from the bi-directional FIFO to the two-frame buffer.
- (e) Multiplexes the data in the two-frame buffer and send them out to the 4x-transfer connector (transfer bus A).

In order to expand the functions of the AJ-DE77 later on, transfer bus B is provided, which can transfer normal speed DVCPRO-compressed signal streams both ways.

## (9) VGA Card

A VGA card is installed in ISA SLOT#1 (SLOT shared with PCI#5) on the Mother Board.

The Targa2000DV does not contain a VGA (640 x 480) display function. Therefore, a card with this function is needed to determine the working status at BIOS level in the maintenance services. It is also used for setting BIOS during boot-up of the PC unit and Windows NT set-up.

The output from this VGA Card is input to the Targa2000DV through the dedicated VGA cable.

While the system generates VGA output, the Targa2000DV sends the VGA output to the CRT monitor. When the system generates the SVGA output, the Targa2000DV drives its on-board SVGA accelerator and sends the SVGA output to the monitor.

## (10) Remote I/O Card

A Remote I/O card is inserted in ISA SLOT#2 on the Mother Board.

Three RS-232C ports and three RS-422A ports, sharing an IRQ resource, are provided for serial data communications. These serial ports are assigned to COM Port 3~8 in Windows NT and are used in the AJ-DE77 as follows:

Com port 3	RS232C	Spare / error report (card bracket)
Com port 4	RS422A	External-VCR2 remote control (card bracket)
Com port 5	RS232C	Optional connection of editing PAD (rear panel)
Com port 6	RS422C	External-VCR remote control (rear panel)
Com port 7	RS422A	Internal-4xVCR remote control (internal connection)
Com port 8	RS232C	Internal-4xVCR error transmission / menu setting (internal connection)

With the AJ-DE77, the COM1/COM2 serial ports installed on the Mother Board are not usually used.

## (11) PC Power Supply Unit

As previously mentioned, the AJ-DE77 adopts a Mother Board with the ATX format. The ATX standard, recommended by Intel, has various power supply features such as remote ON/OFF switching for the secondary power supply and the availability of 3.3V output. The power supply in the AJ-DE77 PC unit conforms to the ATX standard.

#### **4. Outline of uploading from DVC PRO 4x normal speed signal-transfer machine**

From the built-in DVC PRO 4x normal speed signal-transfer machine, four frames of DVC PRO-compressed data (DIF) are successively input in one normal speed frame period to the 4xDVC-PCI I/F. The 4xDVC-PCI I/F utilizes the main memory for DMA transfer to read in the DIF data. In the main memory, the audio data block is extracted, de-shuffled and reproduced as audio data in wave format. The DIF data and audio data in the Main Memory are DMA-transferred to the HDD by the AHA-3940AUWD SCSI host-adapter. The DIF data are recorded every one frame in four HDD under the control of the special file system. The L and R audio data are independently recorded under NTFS control in the HDD formatted by NTFS.

#### **5. Outline of downloading to DVC PRO 4x normal speed signal-transfer machine**

The GUI non-linear editing application reads out DIF data and audio data from the respective HDD at 4x normal speed according to the determined playback sequence. The readout data is DMA-transferred and once stored in the Main Memory by the AHA-3940AUWD SCSI host adapter.

In the Main Memory, the audio data is shuffled in DVC PRO format and replaces the audio block data in the DIF data. The completed DIF data are taken out in the DMA transfer from the Main Memory by 4xDVC-PCI I/F, sent to the built-in DVC PRO 4x normal speed signal-transfer unit, and recorded on tape in the DVC PRO format.

In addition, when A/B roll effects are included in the playback sequence determined by the GUI non-linear editing application, the data in the effect period are once stored on the HDD after receiving hardware-rendering by Targa2000DV, so that they are readout and recorded as a single stream data afterward.

#### **6. Outline of uploading from external video sources using Targa2000DV**

The Video signals input to the Targa2000DV are compressed to DVC PRO-compressed data by DVC Codec in the Targa2000DV and converted to DIF format. Audio signals are converted to wave format after A/D conversion.

The Targa2000DV has no PCI bus master function and receives DMA transfer via the AHA-3940AUWD SCSI host adapter. The DIF data are recorded every one frame in four HDD under the control of the special file system. The L and R audio data are independently recorded under the NTFS control in the HDD formatted by NTFS.

## SECTION 6

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# SERVICE INFORMATION

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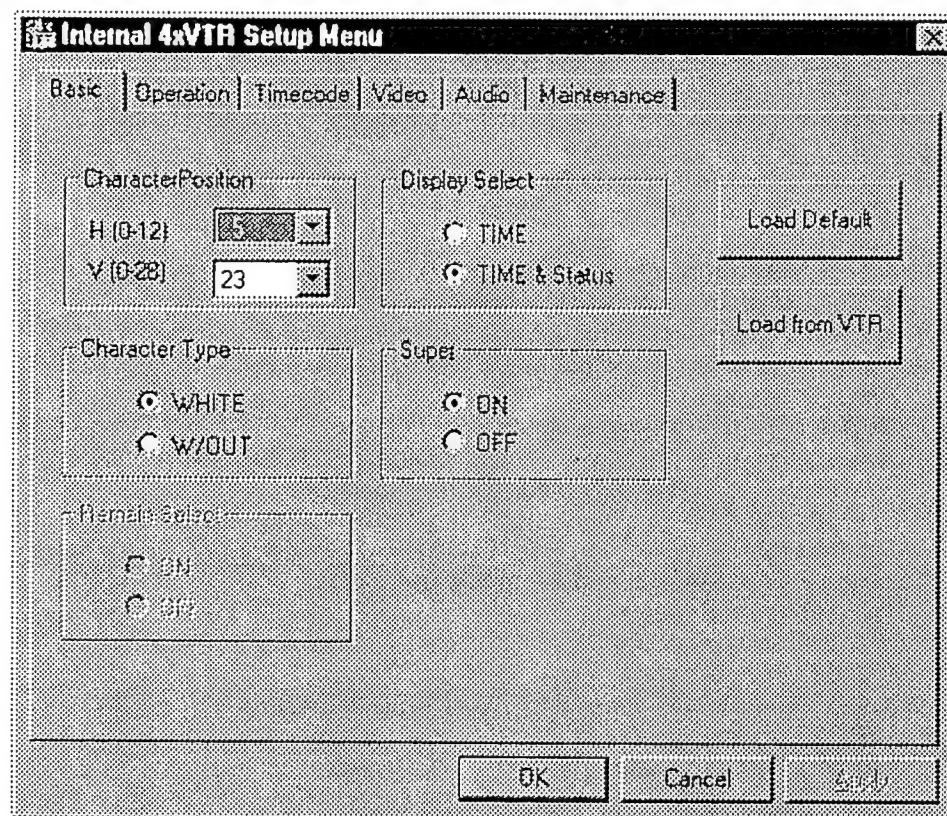
## 1. 4X VTR User Setup menu Utility

The unit's major setting are performed by making selection on menu utility.

The setting menu appear on the computer CRT monitor.

(Start-up Menu Utility application)

- 1) Start-up the quick cutter application.
- 2) Select the special icon on the tool box.
- 3) Select the 4X VTR set-up icon in the set-up panel window.
- 4) Appear the following dialog.

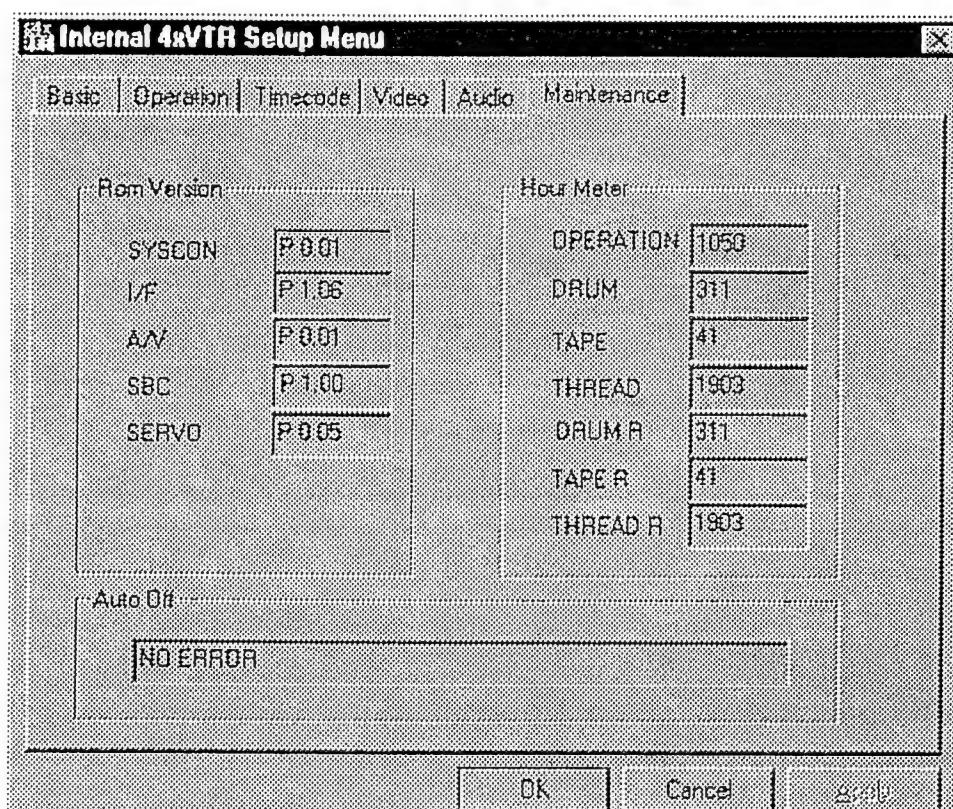


## 1-1. Function of the button

Button	Function
Load Default	Load to Default value
Load from VTR	Read setting data from VTR
OK	Set GUI data to VTR and exit the utility
Cancel	Cancel the operation
Apply	Set GUI data to VTR

## 1-2. Function of the Page

Page	Item	Description	Default
Basic	Character Position	This sets the position of the characters on the horizontal and vertical plane for the time code and other super displays output to the VIDEO OUT 3 connector.	H:5 V:23
	Character Type	This selects the display type for the super display output to the VIDEO OUT 3 connector as well as for displays such as the setting menu, etc. WHITE: White characters against a black background. W/OUT: White characters with a black border.	WHITE
	Display Select	This selects what information is to be provided by the time code and other super displays output to the VIDEO 3 connector. TIME: Time only. TIME & STATUS: Time and status.	TIME & STATUS
	Super	This selects whether the time code and other super display which are output to the VIDEO OUT 3 connector is to shown. OFF: Not shown. ON: Shown.	ON
Operation	Shuttle Max	This sets the maximum speed for shuttle operations. X16: 16X normal speed X32: 32X normal speed X60: 60X normal speed	X32
	FF/REW Max	This sets the maximum speed for FF and REW operations. X32: 32X normal speed X60: 60X normal speed X100: 100X normal speed	X60
	STILL Timer	This selects the time to be taken until the unit goes into the tape protection mode when it is left standing in the stop or search still (JOG/VAR/SHTL)mode. (Unit: s = second, min = minute)	2 Min
Time Code	VITC Position	This sets the position where the VITC signal is to be inserted. (The same line for VITC POS-1 and POS-2 can not be selected.)	Pos-1:11L Pos-2:13L
	VITC BLANK	This selects whether to output the VITC data to the positions selected by VITC POS-1 and VITC POS-2. BLANK: Data is not output. THRU: Data is output.	THRU
Video	V-MUTE Select	This selects whether the video output signals are to be muted when the LOW RF or servo lock release condition occurs during playback. N-Mute: No muting. (Freeze) LOW RF: Muting. (Set to gray.)	Low RF
	Freeze Select	This selects the freeze mode for still pictures. Field: Field freeze. Frame: Frame freeze.	Field
Audio	Monitor Out	This selects the audio monitor output volume UNITY/VARIABLE reference switching. UNITY: The volume is output at the preset value. VAR: The volume is linked with the headphones volume control.	VAR

Page	Item	Description	Default																																
Audio	PB FADE	This selects the processing method for the audio edit points (In point, OUT point) during playback. AUTO: According to the status during recording. CUT: Forced CUT FADE: Forced FADE	AUTO																																
	Monitor CH Select	This selects the monitor output. Manual: The output is as selected in MONITOR SELECT. AUTO 1: The output defaults to CUE AUDIO except when speed factor is between - 0.43X and 1X, inclusive, in which case output is PCM AUDIO.	AUTO 1																																
	Monitor Select	This selects the output signal on the L or R monitor connectors.	L: CH1 R: CH2																																
	CH Out LV	This selects the audio output (CH1) & (CH2) reference level switching. +4dB/ 0dB/ -20dB	0dB																																
	Monitor Out LV	This selects the audio monitor output (R ch) & (L ch) reference level switching. +4dB/ 0dB/ -20dB	0dB																																
Maintenance	 <table border="1"> <thead> <tr> <th colspan="2">Rom Version</th> <th colspan="2">Hour Meter</th> </tr> </thead> <tbody> <tr> <td>SYSECON</td><td>P 0.01</td> <td>OPERATION</td><td>1050</td> </tr> <tr> <td>I/F</td><td>P 1.06</td> <td>DRUM</td><td>3:1</td> </tr> <tr> <td>A/V</td><td>P 0.01</td> <td>TAPE</td><td>41</td> </tr> <tr> <td>SBC</td><td>P 1.00</td> <td>THREAD</td><td>1903</td> </tr> <tr> <td>SERVO</td><td>P 0.05</td> <td>DRUM R</td><td>311</td> </tr> <tr> <td></td><td></td> <td>TAPE R</td><td>41</td> </tr> <tr> <td></td><td></td> <td>THREAD R</td><td>1903</td> </tr> </tbody> </table> <p>Auto Off</p> <p>NO ERROR</p>			Rom Version		Hour Meter		SYSECON	P 0.01	OPERATION	1050	I/F	P 1.06	DRUM	3:1	A/V	P 0.01	TAPE	41	SBC	P 1.00	THREAD	1903	SERVO	P 0.05	DRUM R	311			TAPE R	41			THREAD R	1903
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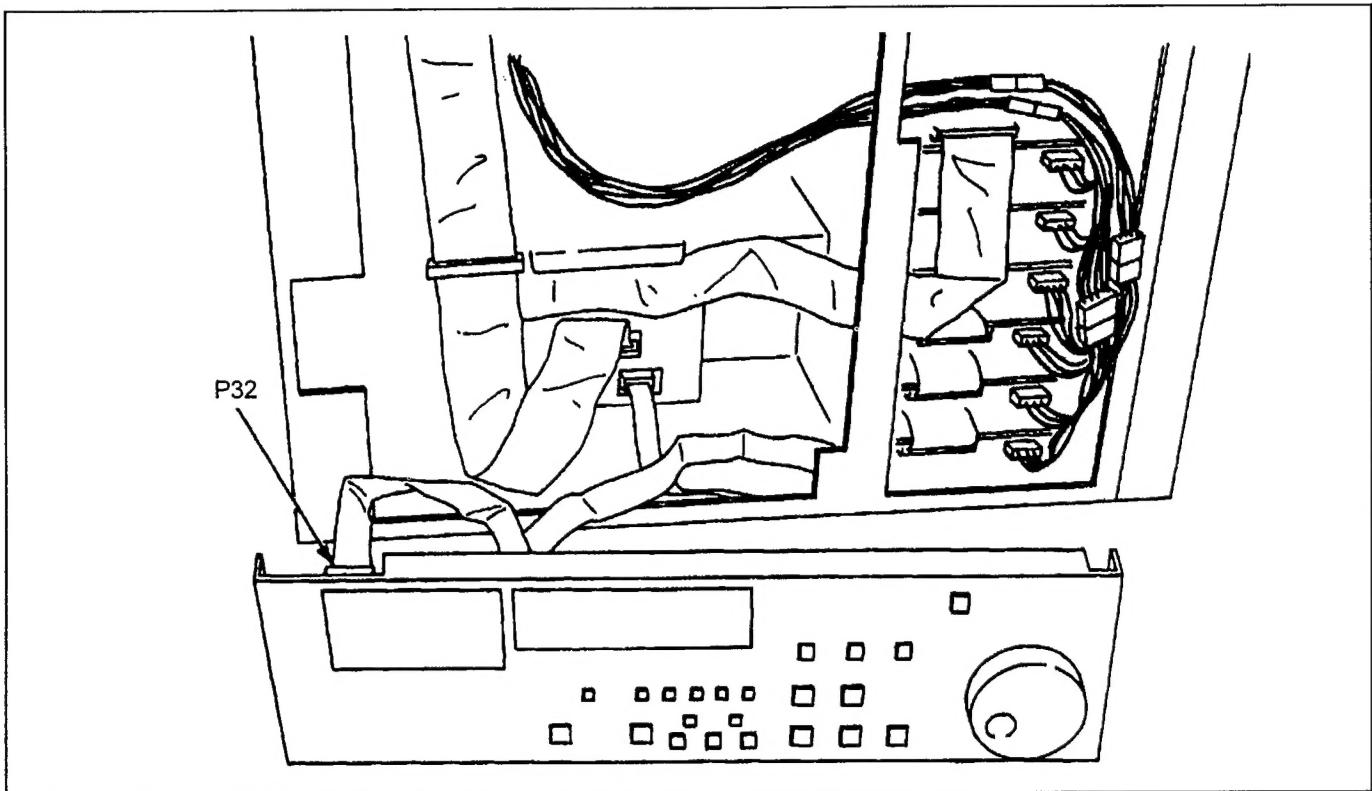
## 2. Service Menu

### Connection of the AJ-D750's Front Panel

AJ-D750's front panel connection is necessary to confirm the items as follows:

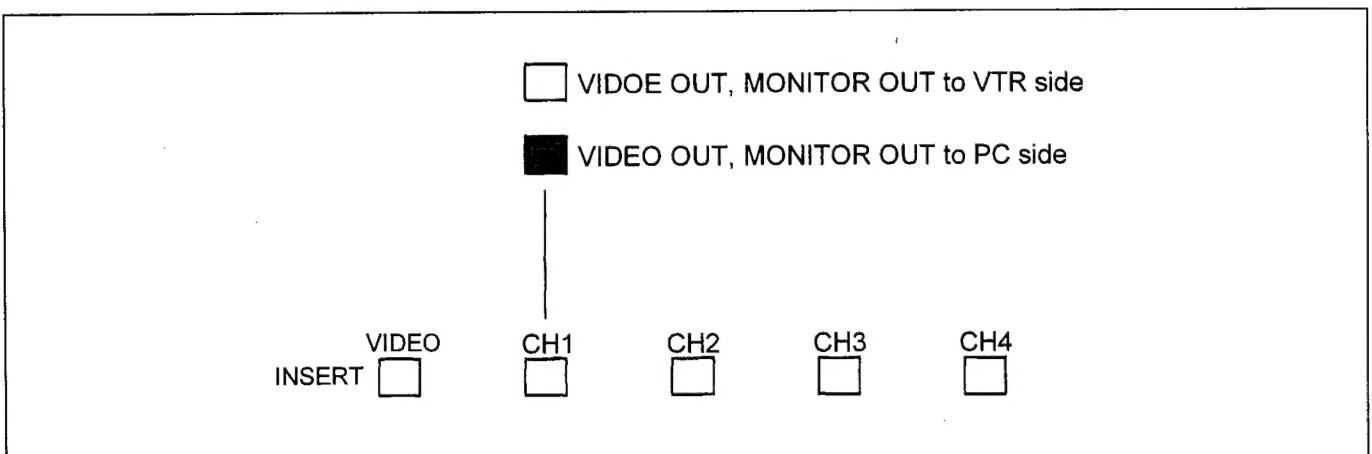
- Adjustment
- Hour meter reset

- 1) Remove the AJ-D750's front panel
- 2) Unscrew the 6 screws on the AJ-DE77's side panel.
- 3) Pull out the cable P32 in the PC section, and connect to the AJ-D750's front panel.



#### 4) Setting of the Front Panel.

- REMOTE/LOCAL SWITCH : [LOCAL]
- DIP SWITCH : all OFF
- INSERT BUTTON : [CH 1] ON



## 2-1. Service Menu Information

1. Set up the Service menu.

### < Condition >

- (1) The "REMOTE/LOCAL" switch set to "LOCAL" on the front panel.
- (2) Set the Dip SW 4-1 to ON position on the bottom side of front panel.
- (3) Press the MENU button on the front panel, then appeared "Adjust item" on the screen as indicated as below.

SERVICE-MENU	
No.A00	
*A00	: SERVO ADJU
B00	: EQ1 ADJUST
C00	: EQ2 ADJUST
D00	: RF1 ADJUST
E00	: RF2 ADJUST
F00	: VIDEO ADJUST
G00	: AUDIO ADJUST
END	

- (4) Move the star mark by JOG Dial to select the each item.
- (5) Press the SET button, then open the "Adjustment Setting item" on the screen.

The contents of each "Adjust Setting item" which are described on next page.

## 2-2. How to Reset the Hour Meter

- (1) Set the DIP SW to OFF (Normal mode) on the front bottom panel.
- (2) Set the DIP SW 501-1 to ON position on the SYSCON P.C.B..
- (3) Press "DIAG" button on the front panel, then appeared Warning Message on the screen.
- (4) Press "SEARCH" button on the front panel, then appeared HOUR METER information on the screen as indicated as below.

OPERATION	200H
DEUM RUN	50H
TAPE RUN	30H
THERADING	100H
DRUM RUN r	50H
TAPE RUN r	30H
THERADING r	100H

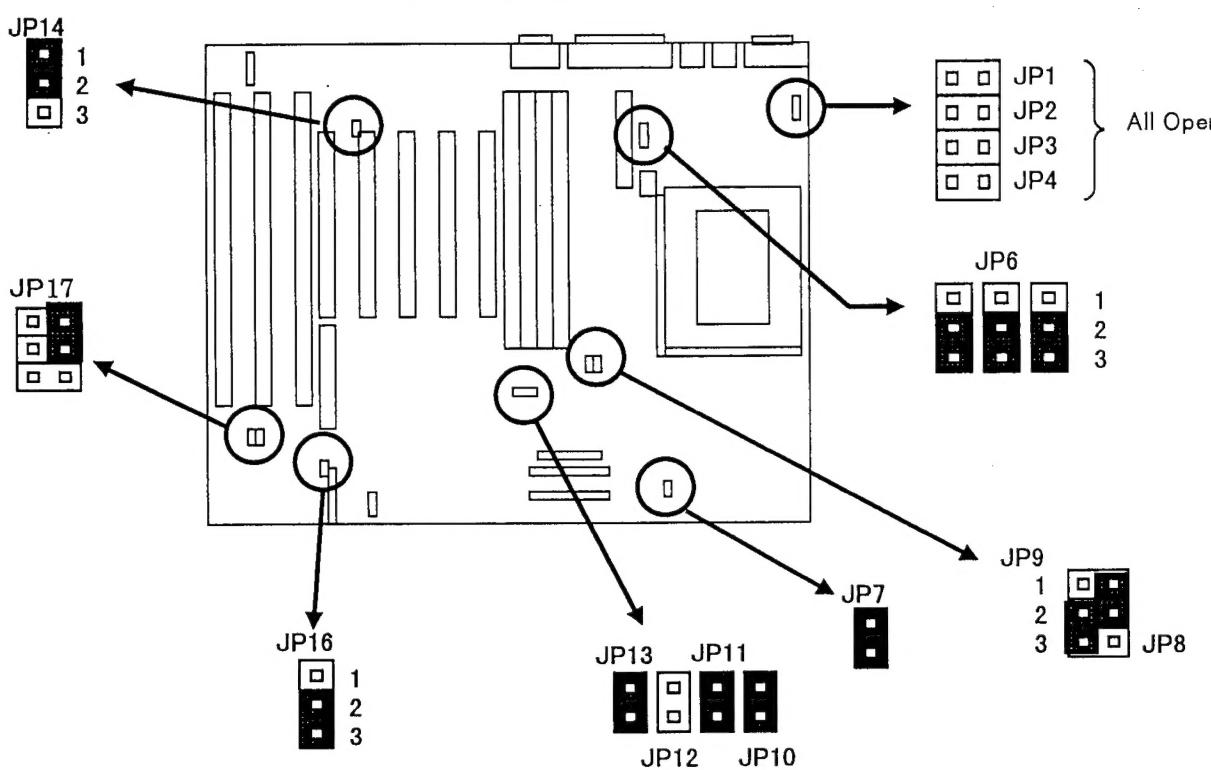
- (5) Set the cursor to mark "r" position and press the "RESET" button, then appeared message on the screen.

DRUM RUN r OK?  
YES <PLAY> NO <STOP>

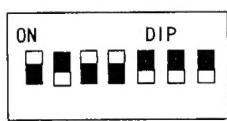
\*When press the "PLAY" button, then excite the reset function.  
When press the "STOP" button, then cancel the reset command.

### 3. CPU Mother & Remote I/O Jumper Setting

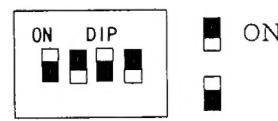
CPU Board



SW1

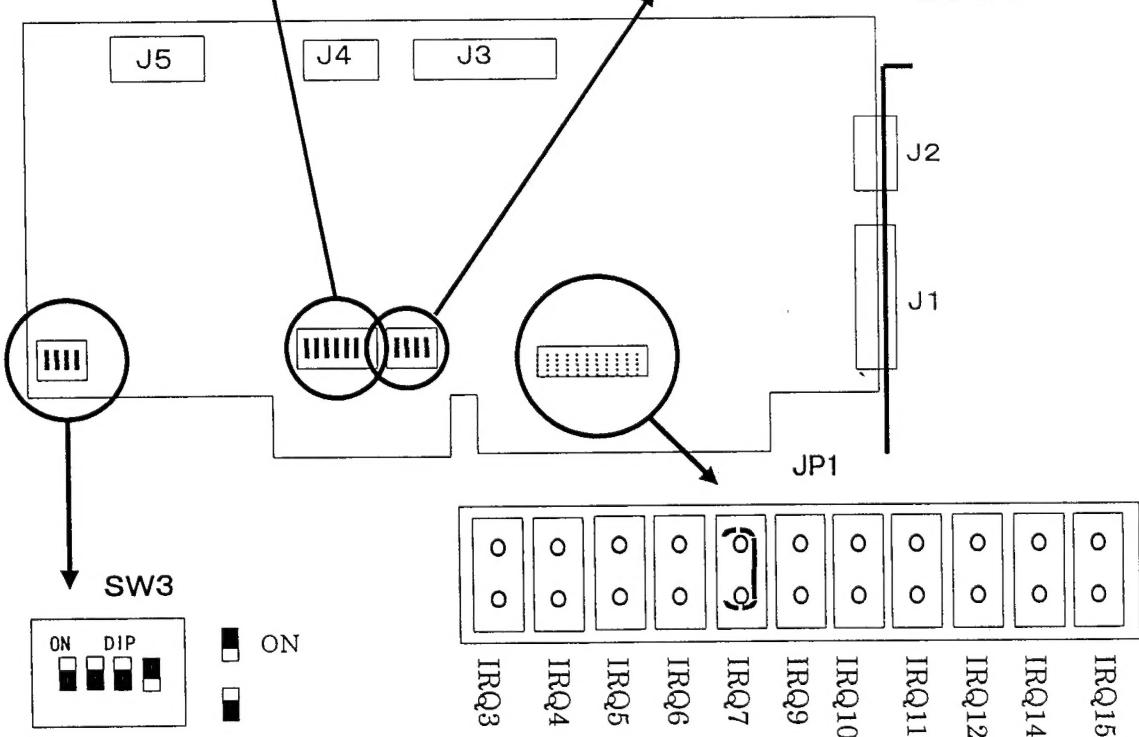


SW2



Remote I/O

Board



# Panasonic